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A SERIOUS MISTAKE IN THE PREPARATION, PROFESSEDLY, OF MISTURA FERRI COMPOSITA.

By J. T. Plummer, M. D., of Richmond, Indiana.

A bottle, purporting to be filled with *Griffith's green draught,*" was brought to me, with the information, that the contents vomited the patient violently, a few minutes after she swallowed it; and afterwards purged her: that, nevertheless, she took the second dose at the time prescribed; but as that dose was followed by the same distressing results, even to the rejection of blood, she declined using the medicine, and I was requested to examine it.

The appearance of the preparation was, at first view, so similar to that of this ferruginous mixture, that, as the patient was of delicate habit, I was inclined to attribute the ill effects of it to an exquisite sensitiveness of the stomach to some of the constituents of the compound. All that was obvious to the senses of sight and smelling evinced that the preparation was, as intended to be, *mist. ferri comp.*

The apothecary, who compounded it, on being consulted, said it was "all right."

Having but little time at command, I was not prepared to enter upon so operose an undertaking, even if practicable, as the complete systematic analysis of such a complex compound of organic and mineral matters. I, therefore, proceeded with a course of exclusion, which, fortunately, brought me early to the point at issue. It appeared evident, that in whatever division of the compound the error, if any, was committed, it was by the introduction of an

acrid emetic substance. What was there on the shelves of the apothecary, of this poisonous character, likely to be substituted for the proper ingredients of this mixture?

The presence of *myrrh* was too apparent to be denied. The spirit of lavender might be present; but liquor potassæ arsenitis, if substituted, would be accompanied by its constituent compound spt. of lavender. This, however, was not probably the poisonous article, as, by calculation, the patient took less than four minims of this constituent in a dose, and the second dose was taken six hours after the first. But, if the arsenical solution had been mistaken for the rose-water, fifty-six minims would have been swallowed at a dose. In this, however, it was improbable that the error lay, for aside from any assuasive influence, the carbonate of iron, if present in the mixture, would have upon the arsenical poison, the odor of the peppermint water, which was intentionally used instead of rose water, was very distinguishable.

As to the solids in the preparation in question, (carbonate of potash, sugar, and sulphate of iron,) one or more of the salts of antimony, lead and zinc, or arsenious acid, or corrosive sublimate, might have been substituted for them.

By the aid of Trommer's test, I satisfactorily determined the presence of *sugar* in the medical mixture.—By the way, I will state that for the same purpose I tried Donaldson's test, which I prepared in 1852; (Amer. Jour. of Pharm. vol. 24;) but it was not reliable; the results being almost precisely the same in an aqueous solution of myrrh, as in the medical preparation. Donaldson's reagent, though very active when recently made, is not a permanent compound.—Sugar, therefore, being present, the apprehended mistake was, in all probability, in respect to the carbonate of potash or sulphate of iron. In one fluid drachm of the medicine, (the dose was only a teaspoonful,) there would be a small fraction over three-tenths of a grain of the chalybeate salt; (exactly .3125 gr;) and less than four-tenths of a grain of the alkaline carbonate. The same quantities of the salts of zinc, lead, or antimony, could hardly produce the pathogenetic effects which the patient experienced; and neither these, nor arsenious acid, or corrosive sublimate would produce, by any reaction with the other constituents of the medical preparation, the bluish

green color of the liquid before me. The salts of copper would. In this case, a carbonate of copper would be formed. Shortly after receiving the "medicine," I poured it into a coarse paper filter. After several days, what did not evaporate, or remain on the filter as a residue, passed through as a pea-green, somewhat turbid fluid. Was this residue on the filter, a carbonate of copper? A portion of it was treated with nitric acid, a very obvious effervescence followed; but the resulting liquid was not of the characteristic color of cupreous salts in solution. Was this owing to the presence of organic matters? Another portion of the residue was, on the affirmative supposition, heated to the charring point, and then subjected to dilute nitric acid: copious effervescence followed. After gently heating the solution, it was filtered: the filtrate was greenish blue, and yielded to ammonia a splendid blue; and to ferrocyanide of potassium an abundant precipitate of a chocolate-brown color. *Copper* was, therefore, unquestionably present in large quantity. What salt of copper was used?

To a portion of the first or turbid filtrate was added solution of chloride of barium; a milky appearance resulted, but even after a long time, no precipitate. To the milky liquid strong nitric acid was added, and the mixture heated. By this means, I was gratified to find, I obtained a precipitate of all the white material, and a transparent, but colored, supernatent fluid; this was decanted, and the precipitate repeatedly washed in the test tube. It was of course, not soluble in nitric acid, which had been added in great excess; nor was it soluble in potash. A *sulphate* was, therefore, clearly indicated; and the conclusion almost, if not wholly unavoidable, that *sulphate of copper* had been introduced into the mixture, instead of sulphate of iron.

On now testing the *turbid* filtrate with ferro-cyanide of potassium, no indications of iron were apparent, but abundant signs of copper were manifest. Ammonia gave no satisfactory results; a bright needle suspended in it for 24 hours, was taken out untarnished; and sulphuretted hydrogen only blackened the filtrate without producing any precipitate after heating and several days repose: thus showing the modifying and opposing influence of the organic matters present, in regard to all these reagents, except the ferro-cyanide of potassium. On acidulating the filtrate, the needle precipitated an abundance of copper.

Thus having detected the presence of this cupreous salt, in large quantity, I did not consider it necessary to prosecute the enquiry any further.

Guy ("Principles of Forensic Medicine,") says truly, that "poisoning with the salts of copper is of very rare occurrence;" and adds: "they are ill adapted to the purposes of the murderer; and, for the same reason, are not likely to be taken accidentally." The reason alluded to, is, of course, the taste and color of these salts; properties so peculiar, that suspicion would be readily excited by them.

It is in reference to this point that the case acquires additional importance; for neither the taste nor color betrayed the poisonous nature of the article swallowed; indeed they rather served to give assurance that no mistake had been committed. *Carbonate* of copper has so near no taste, that were it not for its color, the presence of a cupreous salt would hardly be suspected; and yet in the case before us, the color itself only added to the feeling of security. So that this instance, in which copper was "taken accidentally," furnishes a remarkable exception to the general rule.

The rare occurrence of poisoning by salts of copper, makes it desirable that every example of the kind should find its place on record, until our information on the toxicology of the salts of this metal, is brought nearer to completion. As it is, I find but a solitary case of poisoning by carbonate of copper in any publication which I have examined; and that case is cited by Taylor ("On Poisons,") as occurring in France. So deficient is our knowledge on this subject that no Dispensatory, no treatise on poisons, no medico-legal or other writings consulted, say one word respecting the quantity of carbonate of copper necessary to display deleterious effects. In the case now reported, it is, therefore, of importance to recollect, that, on the supposition that the carbonate was equally diffused through the mixture, *three tenths of a grain* produced twice in the same person violent and prostrating results; and that the admixture of myrrh, sugar, and sulphate of potash, with the cupreous carbonate, did not prevent those results. That all the sulphate of copper was decomposed, is apparent from the inaction of the needle in the turbid filtrate before it was acidulated.

ON GELSEMINUM SEMPERVIRENS.

By M. Henry Kollock.

(Extracted from an Inaugural Essay presented to the Philadelphia College of Pharmacy.)

Gelseminum sempervirens. *Yellow Jessamine. Wild Jessamine. Woodbine.*

Sex. Syst. Pentandria digynia. Nat. Ord. Apocynaceæ.

Terminal flowering branch of Gelseminum sempervirens.

History.—"This plant, the Bignonia nitidum of Michaux and Pursh, has a smooth, twining, glabrous stem, with leaves dark green above, paler beneath, entire, lanceolate, perennial and opposite; short petioles, and bears yellow flowers having an agreeable but rather narcotic odor."

"*Gelseminum*, (Jussieu.) Carolina Jessamine. Calx five-leaved, very small. Corolla funnel form, border spreading, five-lobed, nearly equal. Capsule compressed and flat, bipartite, bilocular. Seed flat, attached to the margins of the valves.

A twining evergreen shrub, not lactescent, leaves opposite; flowers in small axillary and terminal fascicles, yellow; calix subtended by imbricated gemmaceous bractes.

Species.—1st, *G. nitidum.* Flowers fragrant, anthers oblong sagittate; style short, bifid; stigmas linear, oblong, bilobed, pubescent. 2d, *G. inodorum.* Calix, leaves obtuse; flowers inodorous. Near Savannah, in Georgia.—"*Nuttall's Genera of North American Plants.*"

" The yellow jessamine is often planted against walls, pales, &c., as the branches are weak and slender, and it will grow to ten or twelve feet high, if thus supported. The young shoots are of a fine strong green color, angular and a little hairy. The leaves are trifoliate, though sometimes they grow singly. They are placed alternately upon the branches, are of a thick consistence, smooth, and of a fine deep green color. The flowers are yellow, and do not possesses the fragrance of the common jessamine. They are produced early in June, and the blow is soon over; they are succeeded by berries, which, when ripe, are black. Although this shrub possess a certain stiffness, which gives it somewhat the appearance of an artificial flower, yet the fine yellow color of its blossoms contrasts so well with the rich green of the foliage, that in the flower-pot or the bouquet it never fails to have a conspicuous and pleasing effect."—*Jay's Botany.*

The Gelseminum has been known for many years in domestic practice, both in the south and west, as a vermifuge; and generally used in the form of an infusion made from the roots. Having attracted considerable attention as a febrifuge, in consequence of the statements made by Eclectic physicians and others, it seemed desirable that an examination of its chemical constituents should be instituted, and, if possible, the active principle be isolated. " The plant was brought into notice as a febrifuge, as far as we can learn, in the following manner. A planter having been laboring under a severe attack of intermittent fever, which seemed to resist all remedies, requested one of his servants to collect a common root growing

in his garden, and prepare an infusion of it for him to drink. The servant by mistake collected another root, and gave a tea of it to his master, who, shortly after swallowing some of it, was seized with a complete loss of muscular power, and general prostration of the system; unable to move a limb or even to raise his eye-lids, although he could hear and was cognizant of circumstances transpiring around him, his friends collected, expecting every minute to see him breathe his last. After some hours, he gradually recovered himself, and was astonished to find that his fever had left him. Ascertaining from his servant what plant it was that acted in this manner, he collected some of it, and employed it successfully on his own plantation, as well as among his neighbors. The success of this article finally reached the ears of a physician, who prepared from it a nostrum called "Electrical Febrifuge," which was disguised with the essence of wintergreen."

Chemical examination.—Two ounces of the bruised root was macerated in cold water for twenty-four hours, then placed in a displacement apparatus, and half a pint of liquid obtained. This was of a bright red color, similar to Lisbon wine, possessing the disagreeable and strong peculiar odor of the plant.

To a portion of the above infusion, a small quantity of a solution of tannic acid was added, drop by drop, which caused a cloudy precipitate. Another portion of the solution was boiled for about five minutes, which became cloudy after standing. Lastly, a solution of corrosive sublimate was dropped into a fresh portion of the infusion, which again caused a precipitate. It may be noticed that the presence of malic, phosphoric or acetic acids, will prevent the last named test from being decided; this should be obviated by treating either with an alkali or alkaline carbonate, (ammonia, excepted.) From the above, we may conclude that *albumen* exists in considerable quantity.

The muriated tincture of iron yielded a greenish precipitate, indicating tannic or gallic acid; but as the solutions of gelatin and sulphate of the protoxide of iron produced no change, it was inferred that *gallic acid* alone was present.

The dregs remaining in the displacement filter from preparing the infusion, were next boiled in water for about fifteen minutes, and allowed to cool. To the filtered decoction, a few drops of

the tincture of iodine were added, which produced a fine blue color, which disappeared upon the application of heat, evidencing *starch* to be one of its constituents.

The solution of subacetate of lead produced a curdy precipitate, indicating the presence of *gum*.

Two ounces of the root were exhausted with cold water, and then washed with a solution of carbonate of soda, which removed considerable coloring matter. The filtrate was treated with dilute muriatic acid, which caused a copious precipitate soluble in dilute acetic acid, thus demonstrating *pectic acid* to enter into its constitution.

One ounce of the finely powdered root was displaced with ether, to exhaustion, after twenty-four hours maceration. The tincture thus obtained was of a dark green color, and yielded upon evaporation twenty-one grains of a green resin, resembling the resin of the Cannabis indica, (Indian Hemp.) This was insoluble in water, slightly so in alcohol, and possessing the peculiar bitter taste of the drug. Thus showing *fatty resin.*

A small quantity of a tincture made with strong alcohol (.809°) was evaporated to dryness, and the residue laid upon filtering paper, to which it communicated a greasy stain, which did not disappear upon the application of heat; a *fixed oil* was thus proven to exist in it.

A tincture was made by exhausting two ounces of the bruised root by displacement with eight fluidounces of alcohol, .835°. The filtered liquor was of a reddish brown color, and of an intensely bitter taste. One half of this was evaporated to dryness, which yielded a fine garnet colored extract, partially soluble in water and ether. The other half was evaporated to a syrupy consistence and thrown upon a quantity of water, which caused the resin to be precipitated in the form of a yellow powder; this was re-dissolved in alcohol .835°, and some animal charcoal was added; it was then boiled after maceration for twenty-four hours; the solution being colorless, was again thrown upon a quantity of water, by which the resin was precipitated in the form of a colorless powder; it was then collected by decantation and filtration, and when powdered, it resembled powdered tannic acid. To this product, the Eclectic Association have appended the name of "*Gelsemin*," alleging that it is the active principle. By these

experiments, we may infer that *dry acrid resin* is one of its constituents.

The waters into which the evaporated tinctures were thrown, in the above experiment, after the resin had subsided, were evaporated to dryness. The resulting extract possessed the taste and odor of the drug. This was dried upon glass, and a small quantity was thus obtained in the form of scales of a very fine garnet color, very soluble in water, to which menstruum it imparted a brilliant yellow color. *Yellow coloring matter* is consequently, also, one of its constituents.

Two thousand grains of the bruised root were distilled with a saturated solution of chloride of sodium. The distillate was quite milky, when to my surprise, the oil, instead of floating upon the surface, quickly sunk to the bottom of the receiver; thus evidently showing a specific gravity unusual for volatile oils. I did not succeed in obtaining the exact specific gravity of this oil, owing to the difficulty in operating upon such small quantities at a time. This quantity of root yielded about ten minims of oil free from water, the water of course holding some in solution. The oil has the odor of the plant to a considerable extent, if the distillation is conducted at a low heat; if the heat is raised, however, the oil is very liable to become empyreumatic. A heavy *volatile oil* is clearly shown to exist.

Five thousand grains of the bruised root were macerated for twenty-four hours in sufficient cold water to cover it. After the root had become thoroughly saturated with moisture, it was transferred to a displacement apparatus, and cold water allowed to percolate slowly, till the mass was exhausted. This liquid was evaporated upon a water bath to one pint, and filtered to separate the coagulated albumen, and oxygenated matters that had precipitated. It was again carefully evaporated to dryness, yielding a deep brown extract, weighing nine hundred and thirty grains. *Extractive matter* soluble in water, also forms a part of the constituents.

Investigation of the Aqueous Extract.—The aqueous extract possessed the peculiar bitter taste and odor of the plant. It was perfectly soluble in cold water, sparingly so in cold alcohol, but boiling alcohol dissolved about one half. The solutions all showed the presence of an acid by litmus paper, and were more or less colored.

The portion taken up by the alcohol evaporated to dryness, yielding a garnet colored extract of intense bitterness, far surpassing that of the other half. It dissolves readily in cold water.

One hundred grains of the aqueous extract were dissolved in four fluidounces of water, and the solution treated with the solution of the subacetate of lead, until it ceased to produce a precipitate. This was separated by filtration, and the liquid portion submitted to a stream of sulphuretted hydrogen, to eliminate the lead. The supernatant liquor was then evaporated to dryness, in order to get rid of the excess of sulphuretted hydrogen and the acetic acid left by the decomposition of the salt of lead. The extract thus obtained, treated with boiling alcohol and filtered while hot, yielded, upon cooling, a small quantity of crystals, similar in appearance to the sulphate of quinine, and having a very bitter taste. These crystals, which I will call *Acetate of Gelseminia*, were in too small a quantity for me to examine as I wished, nor as I would have done had there been a larger quantity.

An alcoholic extract was made from the powdered root in a displacement apparatus with alcohol .809°. The product was of a brownish color, translucent in thin lamina, and of an intensely bitter taste.

Investigation of the Alcoholic Extract.—One hundred grains of the alcoholic extract were treated with half an ounce of distilled water, acidulated with acetic acid, and heated to about 100° F., a little animal charcoal being added. To the liquor, filtered and partially neutralized by ammonia, a fresh concentrated infusion of galls was gradually added, as long as a precipitate was produced. This precipitate which was tannate of gelseminia, was obtained separate by decanting the liquor; this was then washed with distilled water, mixed with a little alcohol, and then rubbed in a mortar with one-third of very finely powdered litharge. The mixture was heated gently, and submitted to the action of twice its volume of alcohol at about 90° F. The alcoholic solution was then treated with a little animal charcoal, filtered and evaporated at a very gentle heat. The residuum was acted upon twice with cold ether, which removed all impurities, and left the gelseminia in an amorphous state. I did not succeed

in crystallizing it. This substance was white, inodorous and of intense bitterness.

A piece of litmus paper was moistened with a very dilute solution of muriatic acid, which changed the original blue color of the paper to a light red; upon this paper, while yet moist, was laid a very small quantity of the amphorous powder, which instantly restored the blue color to that part of the paper upon which it was placed. Thus evidently showing that this substance is an alkaloid, and, therefore, may properly be called *Gelseminia.*

Examination of the Ashes.—Four hundred and eighty grains of the powdered Jessamine root yielded upon combustion in a platinum crucible, eighteen grains of ashes.

By treatment with water, carbonate and sulphate of potassa were dissolved out. The insoluble residue, after treatment with muriatic acid, left a silicious residue, whilst the acid solution contained salts of iron, lime and magnesia.

The foregoing experiments show that the root of the Gelseminum sempervirens contains *Albumen*, *Gallic Acid*, *Starch*, *Gum*, *Pectic Acid*, *Fatty Resin*, *Fixed Oil*, *Dry Acrid Resin*, *Yellow Coloring Matter*, *Volatile Oil*, *Extractive Matter*, *Lignin*, *Gelseminia*, (a peculiar alkaloid;) *Salts of Potassa*, *Lime*, *Magnesia*, *Iron and Silica.*

The leaves and blossoms, from the few experiments I have been able to institute with them, contain the same ingredients, but in much smaller quantities.

Owing to the difficulty of obtaining the root, and its real scarcity, my experiments in isolating the active principle have not been carried out as far as was desirable; reserving this as a basis for a future paper, I shall simply say in conclusion, that it has been out of my power to experiment with the *Gelseminia.* This I sincerely hope some one will undertake whose opportunities are more favorable to success than mine are.

September 7th, 1854.

[NOTE.—It is to be regretted that Mr. Kollock did not have the acrid resin (*Gelsemin*), the alkaloid *Gelseminia*, and the volatile oil, tried in reference to their medicinal activity. The well known power of hemp resin (Cannabin,) should, at least, induce a trial before deciding this to be inert. If Gelseminia is the *active* principle, it must necessarily be a powerful and interesting substance, worthy of the notice of the experimental therapeutist. The engraving was drawn by the artist from a specimen of the plant.—ED.]

EXAMINATION OF BITARTRATE OF POTASSA.

By John M. Maisch.

In a former paper I have pointed out the necessity and importance of subjecting the commercial drugs and chemicals to an analysis, at least so far as those impurities and adulterations are concerned, that are common to the substances in question. Cream of tartar is among those articles which at present command a very high price, and to the adulteration of which, it might seem, there is much inducement. Tartrate of lime $2CaO, C_8 H_4 O_{10} + 8HO$ is always to be found in the commercial cream of tartar, and can not wholly be separated from it, as it is soluble in water, requiring about 600 parts of boiling water to effect its solution. As cream of tartar is dissolved by about 15 parts of boiling water, it is obvious, that the best article of it will still contain about 3 per cent. of the lime salt. Besides this, cream of tartar sometimes contains copper, from the copper vessels in which it had been purified.

The best way to find these impurities, is by incineration in a crucible, and extracting the residue with hydrochloric acid, when the chlorides of potassium, calcium, &c., will be dissolved; from the solution, copper will be precipitated by hydrosulphuric acid. Five specimens which I have analysed were free of copper, and I determined the quantity of tartrate of lime by adding ammonia in excess to the acid solution, precipitating the lime by oxalate of ammonia, and heating the obtained oxalate of lime carefully, in order to destroy the oxalic acid without expelling any carbonic acid.

Of two specimens, the quantity of lime was determined by dissolving the obtained chloride of calcium in alcohol, and adding sulphuric acid diluted with some water, which will precipitate the lime as sulphate; this, after separation and washing with alcohol, was heated so as to leave the anhydrous sulphate of lime, $CaO\ SO_3$.

From the weight of the obtained carbonate and sulphate of lime, the amount of tartrate of lime was calculated in accordance with the following weights of equivalent:

$$CaO, CO_2\ 50, \quad CaO, SO_3\ 68, \quad 2\ CaO, C_8\ H_4\ O_{10} + 8\ HO\ 260.$$

In every instance, I have used 240 grs. of cream of tartar, from which I had the following results:

I.	11 grs CaO, CO_2	corresponding with	28.6 gr. or	11.92 p. ct.		Tartrate of lime, $= 2\,CaO, C_8H_4O_{10} + 8HO$.
II.	6 " "	" "	15.6 " "	6.08 "		
III.	10 " "	" "	26.0 " "	10.83 "		
IV.	12 " CaO, SO_3	" "	22.94 " "	9.56 "		
V.	17 " "	" "	32.5 " "	13.54 "		

In conclusion, I may remark that specimen I. was of a beautiful white color, inferring the supposition that it had been prepared with much care and would be found very free of lime.

Philadelphia, March, 1855.

ON CORYDALIS FORMOSA—(OR TURKEY CORN.)

By William T. Wenzell.

(An Inaugural Essay presented to the Philadelphia College of Pharmacy.)

Corydalis formosa.

Sex. Syst. Diadelphia pentandria. Nat. Ord. Fumariacæ.

This plant, likewise known as the wild Turkey Pea, Staggerweed, or Choice Dielytra, is an indigenous perennial plant of small stature, its height varying from six to ten inches, rising from a tuberous root. The leaves are radical, somewhat triternate, with incisely pinnatifid segments and very glaucous beneath. The scape is naked and rises from eight to ten inches in height, with four to six cymes, each with from six to ten reddish purple nodding flowers. Racemes compound, the branches cymose; spurs two, short, obtuse incurved, bracts purplish; sepals two, deciduous, style excerted; stigma two horned at the apex, capsule podshaped, indehiscent, two-valved and many seeded.—(*Eclectic Dispensatory.*)

This beautiful little plant flowers very early in the spring. It grows in rich soils on hills and mountains, among rocks and old decayed timber, is found westward, and south of New York to North Carolina. The root or tuber is the only part of the plant medicinally employed. Its appearance is that of a small round ball, sometimes more or less angular, its superior and inferior extremities somewhat depressed. Externally smooth, but when examined with a good lens, exhibiting numerous pores, color varying from a yellowish gray to a dark brown. Internally its color ranges from a light to a dark yellow, according to the age of the

specimen under examination, and mode of desiccation. Its fracture is hard, rough and uneven, presenting numerous glistening points. The powder presents a brownish yellow color, and communicates a harsh and starchy feel, when rubbed or pressed between the fingers. It has a faint peculiar odor, taste at first slightly bitter, succeeded by one peculiarly persistent and somewhat penetrating, influencing the fauces and increasing the flow of saliva. It yields its virtues to water and alcohol.

Course of Analysis.—The powdered root subjected to the action of sulphuric ether in a percolator, until the ether passes perfectly colorless, formed a yellowish brown solution, which left, on spontaneous evaporation, a brown black substance, having the consistence of a soft extract, dissolving nearly entirely in alcohol. This alcoholic solution was precipitated by an alcoholic solution of acetate of lead, as also by admixture with water, and by evaporation, left a resinous mass very acrid and persistent to the taste and aromatic in odor. It easily fused when heated; on raising the heat, dense white fumes were given off, and on still further increasing the temperature it took fire, burning with a black smoke, leaving a light voluminous coal.

II. The powder, after the above exhaustion, was again introduced into a percolator and alcohol (.825) poured into it. The displaced liquid exhibited a deep brownish yellow color and bitter taste. On evaporating in a water bath, adding occasionally water to replace the alcohol volatilized during the process, a resinous matter separated which was soluble in alcohol, but insoluble in ether. The liquid separated from the resin by filtration gave the following reactions. Tincture of galls, solutions of alkalies and their carbonates, gave precipitates, which were re-dissolved on the addition of acetic acid, as also in strong alcohol. A portion of the washed precipitate [by the alkaline solution] placed on litmus paper, previously reddened by extremely dilute acetic acid, instantly restored its blue color. Acetate of lead gave a precipitate soluble in dilute nitric acid.

III. The powdered root after the two previous exhaustions and subsequent drying, was now subjected to the action of cold water. The displaced liquid obtained, possessed a brown color and slight bitter taste, gave precipitates with acetate of lead and protochloride of tin. Subacetate of lead gave, after the action

of the neutral acetate, a white voluminous flocculent precipitate. By heating to ebullition, at the same time adding a few drops of nitric acid, coagulated albumen subsided. On evaporation, the liquid left a brown soft substance possessing adhesive properties.

IV. The powder left after the preceding watery exhaustion, was treated with boiling water until all the starchy matter was removed, as indicated by the action of tincture of iodine on a portion of the washings, boiled and allowed to cool before adding the test.

The cortical portion, cellular substance, &c., thus left, was then treated by continued boiling with water. The filtrate gave a voluminous, white and flocculent precipitate with subacetate of lead, and left a gummy mass on evaporation.

V. The following process was employed for the isolation of the alkaloid. A hydro-alcoholic tincture was evaporated to the expulsion of alcohol, and the resin separated by filtration. To the filtrate, ammonia was added to a slight excess, and the yellow precipitate collected on a filter. The washed precipitate subjected to the action of boiling alcohol, which dissolved the alkaloid, but left a residue, which, on examination, proved to be a mixture of hydrate of magnesia and brown coloring matter. The alcoholic solution was now evaporated to dryness, and the residue treated with dilute hydrochloric acid, when the alkaloid was taken up and an additional quantity of resin left. The muriated solution was precipitated by ammonia, the precipitate dissolved in boiling alcohol and concentrated, when, after a few hours repose, a crystalline compound was deposited. This purified by two or three crystallizations, crystallizes from concentrated alcoholic solutions and by slow evaporation in beautiful, minute, transparent, colorless, slender, four-sided prisms, arranged in tufts or interlacing to form stellar groups, contaminated with adhering yellow bitter extractive, from which they are separated with great difficulty. They are inalterable in air, tasteless and inodorous, very soluble in alcohol, ether and chloroform, but insoluble in water. They are decomposed by concentrated nitric acid with the production of a red color. They form salts with acids very soluble in water. The acetate crystallizes in transparent colorless prisms. The sulphate forms an amorphous scarcely crystalline mass ; the hydro-chlorate in uncrystallizable.

They yield with bi-chloride of mercury an insoluble double salt. The soluble salts are precipitated by alkaline iodides, bromides and ferrocyanides, as insoluble compounds.

From the above statements it will appear that the alkaloid is identical with that described by European chemists, obtained from the Corydalis bulbosa and Corydalis fabacea, plants analogous in their botanical characters to our own indigenous plant, the Corydalis formosa.

VI. The filtrate left in the preceding article after the first precipitation with ammonia, was heated to expel the ammonia, and mixed with a solution of acetate of lead. The precipitate washed and decomposed with dilute sulphuric acid and filtered, the filtrate again precipitated by acetate of lead and decomposed by a current of hydro-sulphuric acid gas, heated to expel the latter, and finally decolorized by passing through prepared animal charcoal. The acid solution thus obtained reddened litmus paper very strongly, and possessed an agreeable acid taste. On testing with solutions of chloride of barium and calcium, barytic and lime waters, no precipitates were obtained.

A portion of the acid solution evaporated to dryness, sublimed with residue, and when boiled with concentrated nitric acid no decomposited ensued. On neutralizing with ammonia and adding chloride of calcium, no precipitate occurred until heating to ebullition. Acetate of lead gave a white voluminous precipitate insoluble in acetic acid and ammonia, but soluble in dilute nitric acid; on heating in water it did not perceptibly change.

Nitrate of silver produced a white precipitate, which did not undergo any alteration in cold or boiling water, even after standing some time.

Sulphate of copper added and heated, a greenish blue crystalline precipitate subsided. Tincture of sesquichloride of iron added and gently heated, a dirty yellow voluminous precipitate immediately subsided. Proto-chloride of manganese reacted similarly to the preceding; a dirty white flocculent precipitate appeared. The acid under examination was, therefore, fumaric acid, a peculiar acid found likewise to be a constituent of the Fumaria officinalis, a plant belonging to the same natural order of plants. In the present course of analysis, I have only stated those reactions of a positive character, neglecting to take note of

such giving negative indications, in order to avoid minutiæ. To give a summary view of the last subject, setting forth its properties and behaviour towards chemical tests, individually and in relation to other known organic acids for the purpose of establishing its identity, the following will perhaps prove how far the results may be from being correct:

Malic Acid is precipitated by barytic water, while fumaric acid is not. A neutral alkaline malate forms a precipitate with nitrate of silver, which changes after a time into colorless transparant crystals. Fumaric acid forms, under similar circumstances, a white precipitate which does not change.

Malic Acid resembles fumaric in the behaviour of alkaline fumarates towards chloride of calcium, both heated on mixing to ebullition. But differs from it in its compound of oxide of lead, which, in the former, melts in hot water, forming a mass of a pitchy consistence; while the latter does not change or melt. Again, the fumarate of copper is insoluble, while the malate crystallizes.

Citric acid. An alkaline citrate is immediately precipitated in the cold by chloride of barium and calcium, while an alkaline fumarate gives no precipitate with the same reagent under similar circumstances.

Tartaric, racemic and oxalic acids resemble fumaric in its behaviour toward solution of gypsum, but differ from fumaric acid in their action upon lime water.

Succinic acid differs from fumaric acid by its salt of protoxide of manganese, which crystallizes, while the fumarate is insoluble. In its salt of zinc, which is very insoluble while the fumarate crystallizes. It resembles fumaric acid by an alkaline succinate producing an insoluble precipitate with persalts of iron, somewhat similar to that obtained by an alkaline fumarate.

Formic acid differs from fumaric by its behaviour towards persalts of mercury and silver which are reduced.

Acetic acid differs from fumaric acid by its salts of protoxide of copper and manganese, which are very soluble.

VII. *Determination of inorganic constituents.* The remaining liquid after the precipitation of the organic acid, and the solution deprived of its excess of lead by hydro-sulphuric acid gas was concentrated and filtered. The solution gave with tartaric acid in excess, a precipitate of bi-tartrate of potassa. Oxalate of ammonia, the white pulverulent precipitate of oxalate of lime. The powdered root, after exhaustion with dilute alcohol on incineration, gave a considerable amount of ashes, which effervesced strongly on dissolving in hydrochloric acid. Evaporated to dryness and dissolved in distilled water, the filtered solution gave, with oxalate of ammonia, a precipitate of oxalate of lime; by the addition of ammonia, the gelatinous hydrate of alumina; with ferrocyanide of potassium, a blue precipitate. A

portion of the gritty residuum, after the action of hydrochloric acid, on being heated with borax in the oxidation flame before the blowpipe, formed a bead communicating a purple tinge, which completely disappeared on exposure to the reduction flame, indicating the presence of peroxide of manganese. Another portion treated with a boiling solution of potassa, then diluted and filtered, on saturating with hydrochloric acid, a gelatinous flocculent precipitate of hydrated silicic acid subsided. The part left untouched, both by hydrochloric acid and solution of potassa, presented small angular crystals, which, when fused with pure potassa, formed a compound readily soluble in water, and precipitated hydrated silicic acid on saturation with hydrochloric acid.

From the foregoing experiments, therefore, the bulb of the Corydalis formosa may be said to contain the following organic and inorganic constituents:

ORGANIC SUBSTANCES.

Corydalia.	Brown coloring matter.
Fumaric acid.	Starch.
Yellow bitter extractive.	Albumen.
Acrid resin soluble in alcohol and ether, containing volatile oil.	Arabin or soluble gum.
Tasteless resin soluble in alcohol, and insoluble in ether.	Bassorin or insoluble gum.
	Cellulose and cortical substance.

INORGANIC SUBSTANCES.

Soluble.

Salts of potassa.	Salts of magnesia.
" " lime.	

Insoluble.

Carbonate of lime.	Protoxide of manganese, (a trace.)
Alumina.	Hydrate silicic acid.
Sesquioxide of iron.	Silicious sand.

Medical Properties and Uses.—Corydalis is considered tonic, diuretic and alterative. In syphilitic affections it is thought by Eclectic practitioners to be the best remedy they possess for that peculiar complaint, and they speak with confidence of its efficacy, ascribing to it almost magical powers. It is also deemed valuable in the treatment of scrofula, and particularly diseases of a cutaneous character. As a tonic, its properties are similar to

the pure bitters. As an alterative, it is spoken of as a remedy of great value. Here, then, we have a medicine uniting three important properties of remedial agents, that of the tonic, diuretic and alterative, and must, if true and successful in standing the test of practice, give us a remedy of no mean value as the future may determine. Dose of the powdered bulb ten to thirty grains. Formula for a tincture and decoction are given in the Eclectic Dispensatory, as also one for the alkaloid "Corydalia," but the substance it produces is nothing more or less than a mixture of corydalia, resin, bitter extractive, hydrate of magnesia and coloring matter, and is administered in one grain doses.

As the pure alkaloid is tasteless and does not seem to possess any sensible medical properties, I may, in truth, state that Corydalia is inert; and the medicinal properties of the plant (if any,) must reside in resin and bitter extractive, and, perhaps, volatile oil.

ON THE TINCTURE OF MURIATE OF IRON.

By Alonzo Caldwell.

Since the officinal introduction of tincture of muriate of iron by the U. S. Pharmacopœia, several attempts have been made to obtain a more certain formula than that originally proposed.

According to the U. S. Dispensatory the preparation often varies from 18 to 40 grains of sesqui-oxide of iron to the fluid ounce—which of course is a matter of great consideration, the standard strength being 32¼ grains.

The failure is no doubt attributable as often to the sub-carbonate of iron as to the muriatic acid employed, it being difficult to dissolve in that acid, especially when old, or dried at too high a temperature. The following plan, I think, will obviate all difficulties, and yield a tincture always of the same strength. It is worthy, at least, of a trial, as it can be made in a few minutes:—

℞. Hydrated sesqui-oxide of iron (in form of magma)	℥xii.
Acid muriatic,	℥viij.
Alcohol,	Oiss.

Boil the hydrated oxide with the acid, in a glass or porcelain vessel, for 15 minutes, add the alcohol, and filter. This tincture yields 35 grains of the dry oxide to the fluid ounce.

Baltimore, March, 1855.

Note by the Editor.—In our last number we published a paper on this subject from Mr. A. P. Sharp, of Baltimore, who suggested that the irregular, and too often deficient strength of this preparation, was due to the commercial acid, which was not so strong as the officinal. To remedy this difficulty, he proposed to pass muriatic acid gas into the mixture of acid and subcarbonate until the solution is perfect.

Mr. H. W. Fuller, pharmaceutist, of Bangor, Maine, in a letter to the editor, remarks, in reference to Mr. Sharp's suggestion, "would it not be an improvement on his process to avoid the application of heat to the mixture, (as in the U. S. P.) and to surround the solution with refrigerants while passing into it the hydrochloric acid gas," so as to favor its absorption?

Now, Mr. Caldwell aims at remedying the original difficulty by the use of hydrated sesqui-oxide of iron in the state of magma, so as to effect the saturation of the acid at once. At first view this appears a good suggestion, but on examination it will be found obnoxious to several criticisms. 1st. The magma of hydrated sesqui-oxide is by no means uniform in its state of hydration, consequently, a given weight does not represent a constant quantity of iron. 2nd. Muriatic acid, as has been shown by Mr. Sharp, cannot be depended upon for strength, and as Mr. Caldwell's process does not control the strength of the acid, this is another objection. 3d. Admitting that the quantity of hydrated oxide prescribed should really be correct, yet a deficiency of acid would still be able to dissolve all the oxide, owing to the formation of oxy-chloride when sesqui-chloride in solution is digested with hydrated sesqui-oxide. Indeed, when a solution of one equivalent of sesqui-chloride is digested till saturated with the oxide, the relation of oxide to chloride is, according to Gmelin, $14\,Fe^2O^3 + Fe^2Cl^3$.

Further; in regard to Mr. Sharp's method, it may be proper to suggest that it is liable, in inexperienced hands, to give an excess of acid, (and this is especially the case if Mr. Fuller's suggestion is adopted, to refrigerate the liquid before passing in the gas,) as the solubility of this gas in water is so great, that it will be absorbed more rapidly than it will combine with the undissolved oxide. We usually overcome the difficulty arising from a deficiency in the strength of the acid by adding more liquid muriatic acid, until (with the application of a moderate heat) the solution is effected. This plan increases the proportion of water slightly, as less alcohol is needed to make up the measure.

NOTE ON THE NOMENCLATURE OF SALTS.

By Franklin Bache, M. D.'

To the Editor of the American Journal of Pharmacy:

In the number for March, 1855, of your Journal, you have published some remarks, by Dr. J. C. Morris, on the nomenclature of salts. The writer advocates the plan of naming them on what may be called the *neutrality principle.* In many neutral salts there is one equivalent of acid for every equivalent of oxygen in the base. This relation is shown in the two salts, severally expressed by the formulæ, FeO,SO_3, and $Fe_2O_3,3SO_3$. But this relation of the acid to the oxygen of the base does not always indicate a neutral salt; for it exists in carbonate of potassa (KO,CO_2) which is an alkaline salt. Again, in borax ($NaO,2BO_3$) there are two equivalents of acid to one equivalent of oxygen in the base, and, with this large proportion of acid, the salt is still alkaline. In relation to this salt Fownes says, "Although by constitution an acid salt, borax has an alkaline reaction to test paper." This is as much as to say, "Although in theory borax is an acid salt, yet in fact it is an alkaline one." Would it not be better to abandon this notion of the constitutional acidity or neutrality of a salt, when it is in so many instances contradicted by the fact?

But, waiving all objections to the principle of a conventional neutrality, founded on the constitution of the salt, irrespective of its reaction with test-paper, it may be useful to inquire, what are the advantages of a nomenclature for salts, based on this principle. In the paper above referred to, it is contended that the generic name, representing the acid in a set of salts having a common acid, must, in all the neutral salts, irrespective of the number of equivalents of acid present, be used without prefix, indicating the number of these equivalents. Thus, in the case of the neutral salts, formed by the union of sulphuric acid with protoxide and sesquioxide of iron respectively (FeO,SO_3, and $Fe_2O_3,3SO_3$), it is contended by the writer of the paper, that the correct names are sulphate of protoxide of iron, and sulphate of sesquioxide of iron; or (indicating the stage of oxidation of the metal of the base by a prefix) protosulphate of iron, and sesquisulphate of iron.

The principle of nomenclature which will be advocated in this

note, is that which represents the equivalent composition, or supposed equivalent composition of a salt, as expressed in its formula, by its name. In this way a picture, as it were, of its formula is presented; and any prefix, denoting a plurality of equivalents of acid in a salt, is not to be taken as indicating in any manner its reaction, whether neutral, acid, or alkaline. According to this plan, the salts, represented by the formulæ, FeO,SO_3, and $Fe_2O_3,3SO_3$, may be called monosulphate of protoxide of iron, and tersulphate of sesquioxide of iron.

Here an incidental question may be noticed; namely, the question of the proper way of indicating the stage of oxidation of the metal of the base, where two oxides of the same metal are salifiable. The prevalent nomenclature, in this case, is to prefix to the name of the salt, syllables indicating the grade of oxidation of the metal. Thus, green vitriol (FeO,SO_3) is called protosulphate of iron. Here the prefix, proto, indicates the grade of oxidation of the iron; and yet it is placed as far off as possible from the word iron, to which it relates. If a chemist were restricted to these precise syllables to express green vitriol, it would be more perspicuous for him to say sulphate of protoiron, prefixing the syllables, proto, to the word they are intended to affect. This change of nomenclature, however, is not advocated; but it is contended that the full name should be used, sacrificing brevity to clearness, and that the salt should be called sulphate of protoxide of iron.

The nomenclature of salts, here advocated, may be called naming them on the *equivalent-composition principle*. The adoption of it requires that the generic name of the salt should be without any prefix having relation to the base. When the generic name receives any prefix, it should denote the number of equivalents of acid. It is evidently confusing to use two prefixes, one relating to the acid, the other to the base. If a salt having the formula, $FeO,2SO_3$, were discovered, the writer commented on would probably call it biprotosulphate of iron; and if we had no single word (potassa) to express protoxide of potassium, then $KO,2CO_2$, on the same principle of nomenclature, would be called by him biprotocarbonate of potassium. On the principle of nomenclature, advocated in this note, it would be named bicarbonate of protoxide of potassium.

In judging of the comparative merits of the nomenclature of salts on the neutrality principle, and on the equivalent-composition principle, the question of the propriety or non-propriety of prefixes relating to the base, is not necessarily involved; but, as the writer, on whose remarks this note is a comment, is willing to use such prefixes, they will be employed in expressing the nomenclature he advocates, in the comparative view given below.

Two sulphates of iron (FeO,SO_3, and $Fe_2O_3,3SO_3$). The names of these salts on the neutrality principle are protosulphate of iron and sesquisulphate of iron; on the equivalent-composition principle, monosulphate of protoxide of iron and tersulphate of sesquioxide of iron. In the two names, here objected to, the word "sulphate" means, first, one equivalent of sulphuric acid, and, afterwards, three equivalents of sulphuric acid. The adept, it is true, can analyze the name, "sesquisulphate of iron." He may say, "sesqui" means that there are three equivalents of oxygen in the base, united with two of iron; and for each of these equivalents of oxygen, there must be one equivalent of acid, that is, three equivalents altogether. In the other name for the same salt, the prefix, ter, relates to the acid, and denotes that three equivalents of acid are present, without depending on a correct inference being drawn that three are present, from knowing the stage of oxidation of the metal. The prefix, mono, given above, is not strictly necessary; but it is better to use it, when, as in this case, two salts of the same metal are in question, containing, severally, one equivalent and more than one equivalent of the same acid. In expressing nitre (KO,NO_5), there would be no motive for saying mononitrate of potassa; because no higher nitrate of this alkali is known.

Salt having the formula, $Fe_2O_3,3NO_5$. The name of this salt on the neutrality principle is sesquinitrate of iron; on the equivalent-composition principle, ternitrate of sesquioxide of iron.

Salt having the formula, $HgO_2,2SO_3$.* The name of this salt on the neutrality principle is deutosulphate of mercury; on the equivalent-composition principle, bisulphate of deutoxide of mercury. The salt having the formula, $HgO_2,4SO_3$, if it existed,

* The old number for the equivalent of mercury is here assumed, and not the old number divided by two.

would, on the neutrality principle, be called bideutosulphate of mercury; on the equivalent-composition principle, quadrisulphate of deutoxide of mercury.

Salt having the formula, $FeO_3,3NO_5$. The name of this salt on the neutrality principle is ternitrate of iron; on the equivalent-composition principle, ternitrate of teroxide of iron. In the paper commented on, it is alleged that the nomenclature objected to, which is that advocated in this note, would lead almost inevitably to the confounding the salts, expressed by the formulæ, $FeO_3,3NO_5$, and $Fe_2O_3,3NO_5$. Now, according to the nomenclature advocated in this note, these salts would have names sufficiently distinct; for the former would be called ternitrate of teroxide of iron, and the latter, ternitrate of sesquioxide of iron. On the neutrality principle, they would be called ternitrate of iron, and sesquinitrate of iron. Here it is seen that the word, ternitrate, is used in different senses, according as the one or the other plan of nomenclature is adopted; but it may be asked whether, in these nitrates, the prefix, ter, is not more appropriate to mean three equivalents of nitric acid, than to mean three equivalents of oxygen, united with one equivalent of iron.

In the paper under notice it is asked whether the term, persesquichloride of iron, is correct for Fe_2Cl_3. It certainly is not; for the prefix, per, is redundant. A chemist may say with propriety that the higher chloride of iron was formerly called perchloride of iron; but that at present it is more precisely called, in view of its admitted composition, sesquichloride of iron.

Philadelphia, March 29th, 1855.

CONCENTRATED WINE OF ASSAFETIDA.

By Henry N. Rittenhouse.

Every pharmaceutist must have experienced the inconvenience and delay of preparing the assafetida mixture (or milk of assafetida as it is commonly called) of the U. S. Pharmacopœia, when it is suddenly called for in small quantities, and as it is the best of all the preparations of this drug, especially for infantile cases, it should be carefully made, and not as is often the case, (with those whose object is to save time and avoid a little trouble,

without any thought as to the consequences,) prepared by adding tincture to the required quanity of water until it has acquired the proper degree of milkiness to resemble the officinal mixture, a practice which cannot be too highly censured, as it contains a great deal of alcohol, and is of unknown strength. I have made a preparation bearing the name at the head of this article, which I think will remove some of the objections to this officinal, as it is in a concentrated form, easily prepared, containing but little alcohol, is of known strength, and can always be kept on hand.

Take of Assafetida . . . ℥ss. troy
White wine . . . f. ʒx.

Rub the assafetida in a mortar to a coarse powder, then add the wine gradually, triturating until all the assafetida is suspended. Wine of assafetida as thus prepared is white, of the consistence of syrup, and has the odor of the drug fully developed. This quantity yields two troy ounces of wine, and as each troy drachm contains fifteen grains of assafetida, the mixture or common milk of assafetida is easily prepared by weighing the required quantity into a bottle, adding the water, and shaking them well together. For instance, in making one fluid ounce of mixture of assafetida, all that is necessary is to weigh out one drachm of the wine and add seven drams of water, and shake them together; this forms a perfectly even mixture without any of the usual inconveniences. The quantity of alcohol in a fluid ounce of this mixture is so small as not to be objectionable, and in the wine it is an advantage, as it tends to preserve it. I have kept it in ordinary corked vials three months, partly during summer, without the least perceptible change.

The assafetida used should be free from all impurities, and the wine thoroughly shaken up before using, as it is impossible to suspend perfectly for an indefinite period so large a quantity of the gum resin in so small a quantity of the menstruum. The object of making it so concentrated was that the alcohol of the wine might not be present in any considerable amount. The unpleasant odor of assafetida can be somewhat disguised by making the mixture with peppermint or spearmint waters where they would not be objectionable. I have tried the same experiments with ammoniac, and with similar results.

Philadelphia, March 4, 1855.

ON THE EFFECTS OF THE SUN-LIGHT ON SYRUPUS FERRI IODIDI.

By John M. Maisch.

Several months since, I published in this journal the results of a series of experiments on the changes of syrup of iodide of iron, and the effect of light on it. Since then I have made another number of experiments with a view to find an easy way of preserving the iodide of iron in a watery solution, and also to ascertain the manner in which sugar acts on this iodide after its change by the oxygen of the atmospheric air.

A fresh prepared aqueous solution, kept in a filled and well-corked vessel, rapidly undergoes a change, no matter whether it had been kept in the dark or was exposed to the direct rays of the sun. The oxygen of the air which has been absorbed during filtration, separates the iron from iodine in the well known way, by forming under the aid of a corresponding quantity of water, sesquioxide of iron and hydriodic acid, which again decomposes, setting some iodine free. An exposure of this decomposed solution to the sun is of no avail; but after sugar has been dissolved in it, and this saccharated solution is put in the sun-light, it at first becomes colorless and afterwards dissolves the oxide of iron. Repeated experiments with the same results always showed the presence of free iodine before the addition of sugar, as I fouud it likewise in the syrup which had undergone this change. But after the aqueous solution had been kept (in a closely stoppered vial) for several months, sugar and sunlight did not produce the expected effect of bleaching and dissolving the separated oxide of iron. The reason of this is doubtless to be looked for in the state of the oxide, which, recently precipitated, is a hydrate easily soluble in acids, but changes to a crystalline state, when it dissolves with difficulty even in the stronger acids. The more completely, therefore, the oxide of iron has become crystalline, the less visible will be the influence of sugar and sunlight. A syrup which has stood decomposed with its precipitated oxide of iron for several months, may become lighter, but not colorless, still containing free iodine in solution and oxide of iron as a precipitate.

As it was interesting to know in what chemical way the sun-

light acted on the syrup in causing it to dissolve the oxide of iron, I subjected several specimens to analysis. After an addition of a little sulphuric acid, *iodine* was set free, recognised by starch. This was more evident after precipitating the iron by carbonate of potassa, filtering and adding the acid to the filtrate. This test proves the presence of *iodic acid*, which is separated by sulphuric acid in connection with *hydriodic* acid, the latter deoxidizing the former, forming water and liberating iodine.

The syrups also contained *sesquioxide of iron* in solution, which was found by adding to the diluted syrup a solution of ferrocyanuret of potassium.

Therefore the syrup after the precipitated oxide of iron has been taken up again by the influence of the sun, contains besides *iodide of iron* probably also an *iodate of the sesquioxide of iron.*

The same was found in specimens, which, although several weeks old, had never separated any oxide of iron, and I think is likely to be found even in a carefully prepared syrup after keeping it for some time in closely corked bottles. It seems to me now as if the action of the atmosphere on the syrup depends not only on the oxidation of the iron, but also partly of the iodine, whilst another part of iodine separates as hydriodic acid. I have come to this conclusion from the fact that the syrup is colored and reacts on iodine before the separation of oxide of iron takes place, which is kept in solution by iodic acid. Other experiments, however, which I have commenced, may throw some light on this supposition, and in due time the results will be published.

Philadelphia, March, 1855.

ON COMPOUND SYRUP OF SQUILL.—(HIVE SYRUP).

By A. P. Sharp, of Baltimore.

Hive Syrup being one of the most common and important syrups kept by the pharmaceutist, it is all important that it should be properly prepared and not likely to ferment. In order to avoid the latter difficulty (which is the common complaint among druggists and pharmaceutists,) I have tried several processes, intended

at the same time, to get possession of all the active principles of the root. The following method has proved the most effectual in overcoming the difficulty spoken of, and at the same time yields a beautiful, active and certain preparation.

As soon as one lot is prepared I immediately put another one under way, as follows:

The seneka and squills, (of each 8 oz.,) are bruised to a coarse powder, and macerated with one gallon of diluted alcohol (alcohol 1 part, water 2), until my stock of syrup is nearly out, (sometimes standing two or three months,) and then pressed or transferred to a percolator and displaced. The tincture is then evaporated until I am satisfied there is no more spirit left. I then filter, when cold, to get rid of the albumen and resinous matter, and then add the sugar (7 lbs. troy) and evaporate (without boiling) to the proper quantity, (6 pints), strain if necessary, and add the tartar emetic (96 grs.). Any one pursuing this plan I think will obtain a syrup that will prove satisfactory to himself as well as to his customers.

Although speaking of hive syrup, the reader will excuse me if I take the occasion to hint at a few things which may be of some use to a few, simple and common as they may be to many. In the first place I would suggest as important, to facilitate the operation of filtering the above tincture, as well as many other things in our line, that every pharmaceutist should have two or three filters of felt, prepared expressly for filtering. Those I have are French, but I presume they can be prepared in any of the cities. No one can appreciate the advantage of them without trial. My smallest size will filter three gallons of laudanum in less than an hour. Percolators are another important article of furniture to a pharmaceutist, and as they are not easily obtained by persons at a distance from the cities, I will suggest a form (and which any one can obtain without trouble) that I use, and am well satisfied with. From a lot of pint, quart, or any other size packing bottles, I select the thickest one among them, and fill it with cold water nearly to the point where I wish it broken, and then holding it in a bucket to prevent the acid from flying, pour in sufficient strong oil of vitriol, (about an equal measure,) observing to hold the bottle vertical, when the bottom immediately falls, generally presenting a smooth fracture on a line with the surface of the inner liquid. Then with a common file smooth off all the sharp edges. I find

tow is much better than cotton to place in the bottom of the percolator. As a general rule, in displacement, the ingredients should be thoroughly saturated with the fluid before putting them in the percolator, otherwise they will swell up and press so tight as to prevent the proper percolation. Every pharmaceutist should have a Beaumé's hydrometer for preparing syrups, testing acids, &c.; also Gay Lussac's or Richter's alcohometer for showing the strength of his alcohol, which should be at least 85 per cent.

In regard to the fermenting quality of sugar, I have found that if a syrup is boiled long it has a greater tendency to ferment from some change taking place in the sugar. For this reason it is well to avoid excessive boiling in syrup making.

Baltimore, March, 1855.

ON AMERICAN OIL OF PEPPERMINT.

By the Editor.

Perhaps there is no volatile oil, the produce of the United States, that is more liable to be found adulterated, or impure from careless preparation, than that of the Menthæ piperita. Afforded in but small proportion, the plant itself requiring careful culture, both as regards the adaptation of soil and frequent attention, and the yield of oil greatly influenced by the season, its price must necessarily be high to remunerate the manufacturer; yet the consumption of the oil is so extensive by the confectioner and druggist, and so much competition in price has arisen among those who trade in it, that a large proportion of what is found in the market is devoid, in great measure, of the agreeable and refreshing aroma belonging to the pure oil, and much of it has a terebinthinate odor and taste, due to oil of turpentine fraudulently admixed.

Some years ago the best oil of peppermint found in the Philadelphia market was prepared in New Jersey, and known as "Borton's Oil of Peppermint." Subsequently Mr. Borton removed to Ohio, and to this day the best oil from that State goes by his name. Of later years, Western New York has produced large quantities of peppermint oil, and the reputation of the Messrs. Hotchkiss, who grow and distil large quantities of the plant, induced us to address them a few queries, which elicited the following letter, viz:

Lyons, March 15, 1855.

WM. PROCTER, JR., ESQ.

Dear Sir,—We acknowledge with pleasure the receipt of your favor of the 23d ultimo, the contents of which have our best attention. Absence from home has prevented an earlier reply. We are extensively engaged in the culture of the peppermint plant and the production of the pure oil therefrom, and for a botanical description of the plant from which our oil is manufactured, its history and uses, &c., we would beg to refer you to "Vol. 3, Class iv., No. 156, pp. 1446, 1447, of the Official, Descriptive, and Illustrated Catalogue of the Great Exhibition," held in London in 1851, and where we had the honor to receive a prize medal for our manufacture of oil of peppermint.

We believe you will "there" find answers to nearly all your enquiries, respecting the article, except the following, viz: "The amount of land under peppermint culture."—"The average yield season with season."—"The amount of care extended to free the mint plants from weeds before distillation;" and which we beg to answer as follows, viz:

In our opinion there is about 2000 acres of land devoted to the peppermint culture in the United States, a great deal of which is under very careless cultivation, and weeds which produce an essential oil allowed to grow amongst it, the most common of which is by some called broom weed, by others mare's tail [Hippuris vulgaris]. These weeds produce oils quite as abundantly as the peppermint, but of course they spoil the flavor of the peppermint oil.

2d. The average yield, season with season, is not far from 20 lbs. per acre of pure peppermint oil.

3d. In one field last year of 20 acres, which we devoted to peppermint culture, we kept an account of the labor of planting the roots, preparing the ground, weeding and mowing the plant, and it reached a trifle over eight hundred days work for a laboring man, worth one dollar per day.

* * * * * * * *

With sentiments of great respect,

Yours truly,

H. G. & L. B. HOTCHKISS.

The average yield obtained by the Messrs. Hotchkiss is nearly similar to that obtained at Mitcham, near London, (see vol. xxiii. page 239 of this Journal,) where an acre yields from 17½ to 20 lbs. of oil. We made application to parties in New York to get some idea of the amount of this oil exported to Europe, but our enquiries have not, as yet, been responded to.

The subject of the preparation and trade in volatile oils in the United States is very interesting, and is much obscured for want of information in reference to the different customs followed by the manufacturers, and in regard to the adulterations resorted to

by wholesale dealers to increase their profits, or to enable them to undersell their neighbors. It is a well ascertained fact that, in New England, distillers of oil of tansy have been in the habit of introducing a large quantity of hemlock twigs and leaves (Abies canadensis) into the still before putting in the tansy and water, and thus produce an oil in which the common oil of hemlock forms the larger proportion. The great difference of various samples of oils, apparently from first hands, leads to the belief that this species of rascality is not confined to the oil named. As the *dispensing* pharmaceutists throughout the United States are deeply interested in this subject, they will greatly oblige us by sending us information bearing on the production or trade in volatile oils, whether relating to a single oil or to several, and in regard to the processes or habits of manufacturers, or the adulterations of dealers, for all which due credit will be given to the writers.

REMARKS ON GUM MESQUITE.

By the Editor.

In our number for January, we published an article on gum mesquite as brought into notice by Dr. G. G. Shumard, in which an account of its chemical characteristics are given. In Silliman's Journal for March Dr. Campbell Morfit, of Baltimore, has published a notice of the same substance from which we extract the following :

"The specific gravity of the gum was 1·5; but this determination may possibly admit of correction upon purer samples than were disposable for the experiment.

Its proximate composition was found to be,—

Water	11.640
Foreign matters . . .	0.236
Bassorin	0.206
Arabin	84.967
Ash	3.000
	100.049

Cerasin was also sought, but not found. The ash was estimated by burning a given quantity in an atmosphere of oxygen, and weighing the residue.

The ultimate analysis, made also by effecting combustion of the carefully dried gum in oxygen gas, yielded, in two separate experiments, the following numbers :—

	I.	II.
Carbon. . .	43.63	43.10
Hydrogen . .	6.11	6.50
Oxygen . .	47.26	47.40
Ash . .	3.00	3.00
	100.00	100.00

These proportions approximate very closely to those obtained from gum Senegal and Arabic, by Guerin and Mulder. The general appearance too of the gum is similar to that of gum Senegal and the dark inferior qualities of gum Arabic. In chemical properties also it is allied to them, being insoluble in absolute alcohol, partially soluble in common alcohol, and readily forming with hot or cold water a very adhesive mucilage. It is, in fine, a true gum, and promises, in its physical and chemical behaviour, much of the advantage expected by its discoverer as an economical substitute for gum Arabic or Senegal.

University of Maryland, Baltimore, January 10, 1855."

By a comparison of some of these statements with those published by us as above, it will be seen that several discrepancies exist. Dr. Morfit gives the specific gravity at 1.5, whilst that obtained by us of a solid lump (by carefully weighing in oil of turpentine of ascertained density, and reducing the numbers by calculation,) was 1.311, very nearly that of gum Arabic. In every instance, and we examined several of the pieces, we found them entirely soluble, except extraneous matter, (bark and other impurities) and saw no evidence of bassorin, (yet as this principle may be considered as matter in transition between lignin and arabin it may easily exist in some specimens and not in others, as is the case with the acacia gums.) The amount of ash obtained by incineration in a platina crucible was but 2.1 per cent., whilst in the above analysis it was 3 per cent. Dr. Morfit's conclusion that gum mesquite is composed chiefly of arabin, is the chief point in his paper to which we take exception, as the opinion does not appear to be founded on any direct test, except insolubility in alcohol and capability of yielding a mucilaginous solution, as the ultimate analysis of the whole gum will hardly be brought as positive evidence of the identity of the soluble matter of gum mesquite and gum arabic. The most striking points of difference in their reactions are—that a solution of gum mesquite is not precipitated by subacetate of lead, nor a dense solution coagulated by borax, and on these grounds the chemical identity of the soluble matter of gum mesquite and the arabin of gum arabic may well be doubted.

Before concluding these remarks, it may be well to suggest that advantage may be taken of the compatibility of gum mezquite and subacetate of lead to use the mucilage of that gum as a vehicle for Goulard's Extract, in those cases where it is desirable to have the emollient and protective influence of mucilage, with the astringent and sedative action of the lead salt. The association of mezquite mucilage and subacetate of lead, with sufficient glycerin to keep it from drying too rapidly, would be a good substitute for many of the less elegant and efficient dressings:—of course the proportion of subacetate should be regulated by the physician in applications to excoriated surfaces.

ON CAFFEIN.

By H. Leuchsenring.

Caffein possessing decided physiological and therapeutic properties, I submit to the notice of our profession a simple and easy process for obtaining it.

A concentrated decoction of coffee or tea,* (cocoa or guarana) is precipitated by a weak solution of acetate of lead; the liquor is filtered and evaporated to dryness; the residue is mixed with fine sand and allowed to sublime by the process of sublimation of Dr. Mohr for benzoic acid.

Caffein thus obtained is in prisms, white, opaque, silky and compact, of a bitter taste, soluble in 98 parts of water—97 of alcohol and in 194 of ether—fuses at 170° Cartier—volatilises at 185°. Its solution in hydrochloric acid is precipitated white, and in chloride of platinum yellow, by tannic acid.†

* Theobroma cacoa or Paullinia sorbilis.

†[Note by the Editor.—This process is the same as that of the Hanoverian Pharmacopœia, a notice of which was published at page 472, vol. xxv. of this Journal. H. J. Versmann (Archiv. der Pharm. lxviii. p. 148) gives a process in which 5 parts of raw coffee in powder mixed with one part of dry hydrate of lime is treated in a displacer with alcohol (sp. gr. ·863) until exhausted. The alcoholic liquids are distilled to regain the alcohol—the fixed oil which floats on the aqueous residue separated, and the residue evaporated, till on cooling it solidifies by crystallization. After standing a while the mother liquid is drained off—the crystals passed between paper to remove the fixed oil, and after solution in boiling water and treatment with

ON THE PREPARATION OF AMYGDALIN FROM PEACH KERNELS.

By Samuel S. Garrigues.

Procter (Amer. Jour. Pharm. x. 195) and Wicke in (Annal. d. Chem. und Pharm. 1853) have shown, that amygdalin is more generally diffused through the pomaceæ and amygdalaceæ than had formerly been supposed; and they found it more particularly generated in the kernels of the fruits of these species. This suggested the idea, whether the kernels of the common peach would not be a cheaper, and a good substitute, for bitter almonds in the preparation of amygdalin. The process recommended by Wittstein, was followed in making my investigations. Thirteen pounds of the dried kernels were finely bruised, slightly warmed, and then subjected to a strong pressure so as to separate as much as possible the oil, which would interfere with the crystallization of the amygdalin. The cake was then removed from the press, and rebruised as finely as possible, and treated with three times its weight of alcohol of 80 per cent, for six hours, at nearly a boiling temperature. It was then strained, whilst warm, through a linen bag, the remainder being again treated with the same quantity of alcohol. The filtrates were then mixed and allowed to stand for a short time, so as to admit of the separation of the oil which subsides at the bottom of the vessel. A portion of amygdalin which also crystallizes out of the solution, is separated from the oil by filtration and pressing between filtering paper. The alcoholic solution was now distilled by a slow fire to ⅛ of its original quantity, and then filtered warm through paper previously wet; the filtrate was then evaporated by a moderate heat to the consistence of thin syrup, and allowed to stand in a cool place for several days. After the syrup had hardened to a crystalline mass, it was mixed with one half its volume of cold alcohol, thrown on a filter and well washed with the same liquid. The crystals were then dissolved in double their volume of hot alcohol, filtered whilst hot, and then allowed to crystallize. The mother liquid also produced

animal charcoal are re-deposited in dazzling white satiny crystals. 100 lbs. of coffee yielded M. Versmann 6 oz. 4 scruples of caffein, or 0·57 per cent. He also obtained 10 per cent of green fixed oil, and 2 per cent of yellow solid fat.]

crystals on further evaporation. After being dried between bibulous paper it was pure enough for medicinal purposes, though by treating it with ether, the fatty oil which adheres to it can be entirely removed.

By this process I obtained about 80 grains of amygdalin to to the pound, somewhat less than the yield from bitter almonds; but when we take into consideration the reasonable price at which the peach kernels can be obtained, I think they will form an advantageous substitute.

The peach kernels yield about one fourth of their weight of fixed oil, which when not too much heated in the process of pressure, will be found to answer most of the purposes of oil of sweet almonds.

Philadelphia, April, 1855.

EXTRACTUM IGNATIÆ AMARÆ ALCOHOLICUM.

By the Editor.

For several months past some of the pharmaceutists of Philadelphia have been called on for an alcoholic extract of the bean of St. Ignatius, required in the form of pills, each containing three quarters of a grain, the pills being intended as a "remedy" for dyspepsia, attended with nervous depression. The formula for the pills, it appears, is furnished by a clergyman of Brooklyn, to all who may apply, he having been cured by it. That so potent a medicine should be prescribed in this loose way, the patient being, in fact, the prescriber, inasmuch as he decides that it is indicated in his case, is a little extraordinary, and may yet lead to mischief. As, however, several physicians are trying its merits, it will soon be ascertained whether these seeds possess any peculiar or specific power, not found in their congener, nux vomica, or whether any advantage their extract may possess, is due solely to the larger proportion of strychnia which they are known to contain.

The beans of St. Ignatius, like nux vomica, have a very horny and tough kernel, (due to bassorin and fixed oil,) which renders it difficult to powder them so as to extract their soluble matter. We have tried several plans, but prefer the following for their extraction. The beans are bruised in an iron or brass mortar

until reduced to small fragments or very coarse powder; they are then moistened with water in a covered vessel, and heated until the tissue of the pieces has become soft and can be bruised into a pulpy mass. This is then mixed with twice its bulk of alcohol, .835, and allowed to macerate in a close vessel in a warm place for 24 hours, and then treated by displacement until 8 or 10 times the weight of the drug is obtained. The alcohol is then distilled off, and the residue heated in a water bath until reduced to the consistence of a soft extract.

Treated in this way, the beans of St. Ignatius yield about ten per cent of extract, having a brown color, peculiar heavy odor, and an intensely bitter taste. The proportion of extract obtained is smaller, (and is contaminated with fixed oil, like the officinal extract of nux vomica), if the seeds in powder are treated directly with alcohol, and thus made it is probably more active; yet, as these beans contain 1.3 per cent. of strychnia, and nux vomica but .3 to .4 per cent., this extract must be considerably more active than the officinal extract of nux vomica. The pills are directed to be made by incorporating 30 grains of the extract, with ten grains of gum arabic in powder, and dividing the mass into forty pills; one of which is to be taken three times a day. We are informed that some apothecaries substitute extract of nux vomica when called upon for that of Ignatia amara—a practice not to be justified, however analogous the preparations may be.

FLUID EXTRACT OF HYDRANGEA.

By Edward Parrish.

The root of Hydrangea arborescens, an indigenous plant found in many parts of the United States, was introduced to the notice of the medical profession by Dr. T. W. Butler, of Burlington, N. J., through the New Jersey Medical Reporter.

Dr. Butler states that his father, who is connected with the mission to the Cherokees, learned of them the merits of this plant in the treatment of gravel and stone, and has himself employed it, in the course of an extensive practice, among a people peculiarly subject to these complaints, for many years. He considers it as a most valuable medicine, and possessed, perhaps, of

specific properties, claiming for it a trial at the hands of practitioners. Dr. Butler's recipe is as follows:—

Take of Root of Hydrangea lb. ii.
Water Oxii.

Boil to four pints, strain, and add

Honey Oii.

Boil further to two pints. The dose is a teaspoonful twice or three times a day. I have prepared the fluid extract of latter time by the following modified recipe, which is quite satisfactory:—

Take of Hydrangea lb. j.
Water 6 pints, or sufficient.

Boil the root in successive portions of water, for a long time, mix this with honey Oij., and further evaporate to Oii. The dose of this is the same as the foregoing, although less concentrated.

The results of its use in irritable conditions of the urethra have proved highly satisfactory, although its value as a specific in lithiasis requires confirmation.

GLEANINGS.—PHARMACEUTICAL AND MEDICAL.

Fluid Extract of Red Bark.—Mr. John Canavan, in the November number of the New York Journal of Pharmacy, [1854,] gives a formula for fluid extract of bark, without, apparently, being aware that two formulæ for similar preparations were published in vol. xxiii, p. 129, of this Journal, and one of them noticed at page 262, U. S. Dispensatory, 10th edition. The preparation made by Mr. Taylor's formula has been extensively used and approved of, and its efficacy is attributable to its being made from calisaya bark, and not containing any sulphuric acid, so that the alkaloids are presented in the same state of combination that occurs naturally, viz: kinates and cinchotannates. Owing to the presence of the latter, Mr. Taylor's fluid extract is always opaque when cold, although transparent when hot. The following is Mr. Canavan's formula:—

Take of Powdered red bark,	8 ounces (Troy.)
Diluted alcohol,	a sufficient quantity.
Diluted sulphuric acid,	" "
White sugar,	8 ounces (Troy.)

Digest the bark in four pints of diluted alcohol, for 24 hours; then filter, and displace the dregs that remain in the filter, with diluted alcohol, acidulated with the diluted acid until the liquid passes nearly tasteless. Then mix the two liquors, evaporate to one pint, and filter; to this add the sugar and dissolve without heat. The whole measures about twenty fluid ounces, and a teaspoonful (one drachm) represents about twenty-five grains of the bark. During the evaporation, the coloring matter of the cinchona is nearly all precipitated along with the resin, which retains a small portion of the alkaloids."

The proportion of sulphuric acid is not mentioned, which is an imperfection, as, not being volatilized in the concentration of the tincture, it is all retained in the fluid extract, if inadvertently used in excess.

Glycerin as an Internal Remedy.—Dr. J. L. Crawcour, of New Orleans, (New Orleans Med. News and Hosp. Gaz.) calls the attention of the medical profession to the "*special* action of glycerin on the economy, and the perfect safety with which it can be used as an internal remedy." He employs it in all cases where he formerly used cod-liver oil, and with better effect, for it possesses all the remedial virtues of the latter without disordering the digestion. It has been employed in phthisis and scrofulous disease with marked success. In addition to its antistrumous property, Dr. C. finds that it materially aids in the assimilation of the salts of iron, especially the iodide. The dose administered is from one to three drachms, three times daily in an ounce of water; in from one to two drachms, it, in a short period, relieves the cough, improves the digestive powers, and increases the deposition of fat. The author directs attention to the impurity of much of the commercial glycerin, and the presence of lead in some of it, should be especially looked to when used internally. Dr. Crawcour suggests that hot glycerin will dissolve phosphorus in the ratio of two grains to the fluid ounce, and considers the resulting glycerole of phosphorus as much superior to common phosphoretted oil. From the effect of this solution on himself, he is of the opinion that in this form phosphorus more readily enters the circulation and manifests its peculiar stimulant action. He thinks 10 to 30 minims as sufficient; as a fluid drachm taken by himself so disturbed the func-

tions of the heart and brain as to make him consider that dose excessive, although representing but a quarter of a grain of phosphorus.

Preserved Meat-Juice.—Prof. R. Christison, of Edinburgh, in an article in the London Monthly Journal, calls attention to the preserved meat-juice of Mr. Gillon as a very useful article. We quote the following from the (Philad.) Medical Examiner's notice of this paper.

"This substance is the pure juice of beef, preserved in the way in which meats and vegetables are now so extensively preserved in the fresh state, for store provisions. The mode of preparation is as follows:—Cylindrical cases of tinned iron are filled each with six pounds and a half of beef: and the lid is soldered on, but with a hole about half an inch in diameter in the middle of it. Two trays of such cases are shoved into iron retorts, analogous in form to retorts for gas-making, but double-cased, so that steam may be introduced into the interstices around. They are thus subjected to a heat of 220° under steam pressure, for about three hours; by which the beef is partially cooked, and, being thus made to contract strongly on itself, squeezes out a portion of its juice, amounting to a few ounces from each tin. The tins are then drawn, the juice is poured out, and the meat, with certain additions, is subjected to the preservative process. The juice, after being cooled, and entirely freed from fat, is put into small four-ounce tin cases. Each of these has a small aperture at each end, which is secured by solder, after the juice is poured in. The tins are then subjected, on trays, to a temperature of 220° in a muriate of lime bath. On being removed, the solderer rapidly touches with his iron the solder on top, which giving way allows steam to rush out forcibly, and carry with it the air in the upper part of the interior. By the time he has thus swiftly passed over sixteen or twenty tins, the first is ready for being re-soldered by a similar dexterous application of his iron, which then in succession as quickly secures the whole open and steaming apertures. The process of heating in the bath, tapping, and resoldering, is then repeated a second time, to make sure of the thorough expulsion of every particle of air. The tins are finally painted, to preserve them against rust.

The process is most perfect. I have repeatedly opened tins eighteen months in my possession, and stated to have been many months in store when I got them, and in every instance the contents had the rich delicate aroma and taste of fresh beef-juice. Sometimes the taste is slightly resinous or soapy, in consequence of a little resin having obtained admission in the operation of soldering. But as this does not occur often, the impurity may be avoided with due care. The juice may be taken with relish in small quantity, either cold or warm, in its concentrated shape; but it is rather strong to be used without dilution. When diluted with three times its volume

of boiling water, and duly seasoned with salt and pepper, it makes a more palateable beef-tea than any which can be made in the usual way. Sometimes, indeed, a patient will be found to prefer the ordinary sort, either because the preserved juice has unluckily been resinous, or on the same principle that leads some people from the plains of England to prefer hard water to the pure mountain springs of the primitive districts of Scotland, viz: because they are not accustomed to the finer sort. But this is not the general fact; and there can be no doubt that the preserved meat juice makes a most palateable beef tea, and an equally eligible basis for many soups."

Attention has lately been recalled to the value of the matters soluble in water to be extracted from flesh—ozmazome and saline matters—as a nutriment for invalids, when ordinary food disgusts, or will not be borne. In many of these cases, beef-tea, properly prepared, stimulates the appetite, and greatly helps the physician in the difficulties often met with in the dietetical treatment of patients. Liebig also has published a recipe for meat broth. In relation to its modus operandi Dr. Christison remarks:—

"What is its mode of action? Not simply nutrient. A quarter of an ounce of the most nutritive material cannot nearly replace the daily wear and tear of the tissues in any circumstances. Possibly it belongs to a new denomination of remedies, whose action never was even suspected to exist until recently—those which, by some peculiar influence, diminish the waste of the tissues under the exercise of their functions. Professor Lehmann has proved (*Annalen der Chemie*, 1853) that coffee possesses this singular property in so remarkable a degree, that, in persons following an active occupation, an infusion of an ounce of roasted coffee daily will reduce the daily waste by a fourth part; and the same property seems likewise to belong to tea, and other restorative beverages. It is not improbable that the sapid and saline principles of meat, united to what is called ozmazome, and constituting the ingredients of beef-tea and meat-juice, possess some such property. It is difficult otherwise to account for the interesting results obtained by the late Dr. Edwards, in 1833, who, in his researches on nutrition,—strangely overlooked by the celebrated Gelatin Commission of the French Institute, in their condemnatory report on gelatin in 1841,—found that dogs die slowly if fed on bread and gelatin alone, but, when thus greatly reduced, quickly regain flesh and strength by the addition of two ounces of meat-tea, which cannot appreciably increase their texture by its own insignificant amount of solids. Either it acts as a digestive ferment, so to speak,—promoting the assimilation of other nutriment—or, like coffee, it must lessen the waste of the tissues in the exercise of their functions.

Mr. Gillon's meat-juice contains only 6½ per cent. of solids. As a mere

nutrient, therefore, it is much in the same category with beef-tea. Sixteen ounces of beef-tea, made with the contents of one tin, yield only 114 grains of solid extract. It contains no fibrin, no albumen, no gelatin. It does not even gelatinize on exposure to the air for days; it is ozmazome, with the salts and sapid and odorous principles of meat, and is materially different from all boiled extracts."

EXTRACTUM SUMBUL FLUIDUM.

By William Procter, Jr.

Sumbul, or *musk root,* was introduced into German Pharmacy about the year 1840, and from thence has gradually made its way into France, England and the United States; first as a curiosity of the Materia Medica, and afterwards as the basis of several pharmaceutical preparations. Musk root enters Russian commerce through Kiakta, from Central Asia, where it has long been in use as a medicine, and through Russia other countries are supplied. Notices of this root have already been published in this Journal (vol. xvi. 119, and vol. xxiii. 223) and the last editions of the U. S. Dispensatory and Pereira's Materia Medica describe it. Reinsch has examined the root and found an essential oil, (not the source of its musk odor,) a nearly colorless copaiba-like oleo-resin, a waxy substance, a bitter substance, coloring matter, starch and gum. He also found that the oleo-resin, by treatment with potash and water, yielded a crystallizable substance having a powerful musk odor. As the substance giving musk odor to this root does not distil over with water, and is communicated to water in the decoction, it is probably constituted, in some respects, like that of vanilla. The oleo-resin is chemically the most interesting ingredient, and is best extracted by ether and alcohol. The chemistry of musk root deserves more attention than it has yet received.

Within a few months past several physicians of Philadelphia have prescribed a fluid extract of sumbul, which is stated by Mr. Simes to be of the strength of a grain to the minim. As musk root is analogous in its therapeutic properties to valerian, the following recipe has been made to correspond in strength with the officinal fluid extract of valerian for this reason, as well as because its peculiar constitution seems to require more menstruum than the proportion stated by Mr. Simes.

Take of Musk root, four ounces (troy)
Ether, four fluid ounces.
Alcohol and water, of each, q. s.

Bruise the musk root, moistened with a little alcohol, until reduced to a coarse powder; mix the ether with twice its volume of alcohol, pour it on the musk root, macerate in a covered vessel, for 24 hours, and introduce the mixture into a suitable percolator. The absorbed tincture (which has a light brown color) is displaced slowly by alcohol (sp. gr. ·835) until twelve fluid ounces are obtained, when the process is continued with a mixture of alcohol and water (equal parts) until a pint has passed. Water is then poured on the residue until a pint of liquid has filtered. The ethereo-alcoholic tincture is suffered to evaporate in a warm place until reduced to two fluid ounces; the hydro-alcoholic tincture is concentrated on a water bath to the same bulk; and the watery infusion evaporated to one fluid ounce. The two last liquids are now mixed, three fluid ounces of pure alcohol added to the first (ethereal) liquid to dissolve the oleo-resin, and the other mixture added gradually with agitation, so that the whole shall measure eight fluid ounces, the mixture being afterwards shaken occasionally for 24 hours. A portion of oleo-resin and some gummy extractive remain undissolved, and must either be removed by filtration or left as a sediment.

When the ethereo-alcoholic tincture is evaporated to one-sixth, nearly all the oleo-resin separates, and hence the necessity of redissolving this by alcohol before adding the other liquids.

The dose of this fluid extract is from 15 minims to a fluid drachm. The properties of the preparation are analogous to those of valerian, and are used in hysteria, dysmennorhœa, and other nervous disorders, and Dr. Wood informs us that it is highly valued in Moscow as a remedy in delirium tremens.

ON THE MATERIA MEDICA OF THE SANDWICH ISLANDS.

By Luther H. Gulick, M. D., of Ascension Island.

[The following notices taken from a paper on the "Climates, Diseases and Materia Medica of the Sandwich (Hawaiian) Islands," by Dr. Gulick, published in the New York Journal of Medicine and Collateral Sciences for March. It is, in reality, a matter of secondary moment, whether these Islands belong to the United States or not, but it *is* of great importance

that their tropical productions should be increased and encouraged, so as to become to the Pacific States what Cuba and the Bahamas at present are to the Atlantic region—a perennial fruit garden and salubrious resort for the invalid.—EDITOR AMERICAN JOURNAL OF PHARMACY.]

The *Arum esculentum* is a plant very nearly allied to the arum maculatum and arum triphyllum in all its external habits and properties, and probably, like them, possesses a "property of stimulating the secretions, particularly those of the skin and lungs." (U. S. Dispensatory.) It is the principal article of diet among the Hawaiians. The heat of the oven dispels its peculiar acrid principle and renders it a very nutritious and valuable article of diet, had in great esteem by foreigners, but especially by the natives. The acridity is probably reduced by cultivation, but a very considerable portion of it is still retained. Says Dr. Chapin:—"It is, when raw, very styptic and acrid, and the skin of the root is used by the natives in the cure of dysenteries and intestinal hemorrhages."

The *Cucurbita lagenaria*, or gourd, is used as a purgative. It is, in its medical properties, allied to several of the cucurbitacæ, particularly to the cucumis colocynthis. "The pulp of the root is used," says Dr. Chapin, "and in large doses it is terribly drastic. The inordinate doses given by the natives sometimes produce dysentery, rapidly fatal." Dr. Judd relates the case of a woman purged to death with this article by a native physician, for an imagined disease. "About four feet of the green running vine of the bitter calabash, or gourd, thirty-two feet of the hollow stems which support the leaves, and about one ounce of the dry pulp, next the shell, of the dried gourd, were pounded together on a board and the juice mixed with about three pints of water." "It is used by them successfully in dropsies. I once knew a native, with abdominal dropsy, cured by one of his own physicians with this article, after he had been treated unsuccessfully by foreign skill." (Dr. Chapin.)

A variety of *Ipomea* is mentioned by Dr. Chapin. "The roots are used by the natives as an emetico-cathartic. I tried it somewhat, and found it had efficacy; but the doses requisite were so large and the trouble of preparing it such, I abandoned it." I am utterly unable to give the specific title. It is questionable whether its medical powers have been fully ascertained.

The *Aleurites triloba*, or candle-nut, is one of the articles of

the Hawaiian Dispensary. "The kernels of these are stuck, one over another, like beads, upon a fibre of cocoa-nut leaf, a foot long, and, containing a considerable proportion of inflammable oil, they give sufficient light for ordinary purposes, the flame communicating downward till the last piece is consumed. Sometimes five or six such strings, two yards in length, are wrapped in a leaf of banana, and carried before the king, as flambeaux, when he travels by night." (Tyerman and Bennet's Journal.) Dr. Chapin remarks:—"I know it to be used as a cathartic, but never experimented with it myself." An oil extracted from this nut forms an article of export for painting—may it not have available medicinal properties?

The *Piper methysticum*, called "*ava*" by the Hawaiians, is one of the most important of their indigenous Materia Medica. From it they prepared a narcotic drink, esteemed throughout Polynesia. The bark of its stem is possessed of the peculiar properties of the plant, but it is the root which was principally used by them. "They prepared it for use by mastication. A person chews it thoroughly, and ejects it with the accumulated saliva into a dish, in which state it is drunk by the patient. Most of their medicines they prepare in the same manner." In continuation, Dr. Chapin says to the author:—"I supposed it might be serviceable as an anodyne: I gave it repeatedly in powder. It did not seem to possess narcotic properties, and after a number of trials with it I gave it up. The natives, as they said, used it to cure cutaneous diseases, by producing desquamation of the cuticle. They give it daily in such quantities as at length to accomplish the object. I think the article deserves further trial." Mr. Bingham informs me that "the juice is highly valued, and was much used both as a luxury and as a medicine, as alcohol still is in wiser countries. A singular effect of taking a course of ava was the cracking and coming off of the cuticle over the whole body of the patient, with which, it is maintained, the system parted with maladies." Mr. Jarvis says:—"Its effects were very pernicious, covering the body with a white scurf, * * * inflaming the eyes and causing premature decrepitude. It was also taken as a medicine, and was supposed to be an effectual remedy for corpulence." Mr. Ellis speaks of the "burning effect and unpleasant taste of the ava." A few years since, a gentleman, long a resident of the Islands,

proposed exporting it to the United States, and there manufacturing of it some nostrum—which might, no doubt, have become as popular as Townsend's Sarsaparilla! Its medicinal properties are, perhaps, allied to those of the *Piper angustifolium*, or Matico, of which the U. S. Dispensatory says:—"Its most useful internal application is, probably, as an alterative stimulant to the diseased mucous membranes." The Dispensatory refers to an article by Mr. Morson, on the *Ava*, in *The Pharm. Journal and Transactions*, Vol. 3, p. 472, which I have not been able to obtain.

Lime (calx) is readily prepared by the calcination of coral.

Nitre (potassæ nitras,) of which J. G. Sawkins remarks, it "is not found pure, so far as I can learn, on this group." (*Agricultural Report*, Vol. 1, No. 2.)

Sulphur, from about the crater of Kilanea.

Common Salt (sodii chloridum) is manufactured in considerable quantities from the ocean, and is also collected from the salt lake of *Alia-packai*. During the year ending June 30th, 1851, 5,332½ barrels of salt were exported. Mr. Sawkins remarks of the Island salt, that it is "rarely pure, on account of the sulphurous gases of the neighboring active volcanoes."

Glauber's Salt (sodæ sulphat.) is found at Kilanea, and has been occasionally used.

Sponges (spongia officinalis.) They are, however, a very coarse, inferior article.

The Sorrel (rumex acetosa.)

Arrow-root (tacca oceanica.) From July 1st, 1850, to June 30th, 1851, inclusive, 16,780 pounds of prepared Arrow-root were exported. I extract the following from The United States Dispensatory:—"A variety of Arrow-root has been imported from the Sandwich Islands. It was supposed to be procured from the root of *Tacca pinnatifida*, which grows abundantly in Tahiti and other islands of the South Pacific; but Mr. Nuttall, during his visit to the Sandwich Islands, found that it was the product of another species of Tacca, which he describes under the name of Tacca oceanica. (*Am. Journal of Pharmacy*, ix., 305.) It is said that a similar product is obtained from Tacca pinnatifida, growing in the East India province of Arracan."

The Sugar Cane (saccharum) is by far the most important of the indigenous Materia Medica, in a commercial aspect. The

manufactured *Sugar* which was exported, amounted in 1849 to 653,820 pounds, and in 1850 to 750,238 pounds. The exported *Molasses* (sacchari fæx) amounted in 1849 to 41,235 gallons, and in 1850 to 53,855 gallons.

A large number of the "Flora Medica" have been introduced since the discovery of the group. Quite a number of them are thoroughly naturalized; and some are already of great importance among the exports, though in every such instance the article is not only a medicine, but also a food. Without question, the Sandwich Islands will yet produce for export many of the Materia Medica proper. From the paucity of my facts, I can do little more than give a mere list of these introductions, and even this will be defective.

I will not mention the *unofficinal* articles.

Coffee (coffea arabica.) This was first permanently introduced by Lord Byron in 1828. In 1849, 28,231 pounds of coffee were exported, and in 1850, 208,428 pounds. (Cheever's *Sandwich Islands.*) It is of an excellent quality.

Indigo (indigofera.) In many parts of the Islands it now grows wild. From experiments made by the writer many years since, the Sandwich Islands indigo may be pronounced a good variety—probably quite as good, in its medicinal and economical and manufacturing properties, as any in the markets of the world.

The Touch-me-not (impatiens noli-me-tangere) grows luxuriantly.

Onions (capa.) They are greatly relished by the natives as a condiment, and raised by them in considerable quantities. During the year ending June 30, 1851, 3,759 barrels were exported.

The Irish Potato (solanum tuberosum.) Of these there were exported, in 1849, 858 barrels, and in 1850, 51,957 barrels.

Indian Corn or *Maize* (zea mays) grows well; is not extensively raised. During the year ending June 30, 1851, five barrels were exported.

Indian Rubber or *Caoutchouc* (syphonia cahuchu, or S. elastica.) A very useful tree, which it is to be hoped will be rapidly multiplied on the Islands.

Rice (oriza sativa.) As yet it is only raised experimentally, but it may become an important production.

The Pumpkin (cucurbita pepo.) *The Muskmelon* (cucumis melo.) *The Cucumber* (cucumis sativus.)

Of *officinal* plants, the following imperfect list will serve our purpose of exhibiting the admirable adaptation of the soil and climate to the production of many choice articles, and of indicating how independent of other countries, as to their Materia Medica, these Islands may become.

The Castor Oil (ricinus communis.) This may be said to be effectually naturalized. In many places it grows, becoming a perennial. As yet no considerable use is made of it. There may, however, come a time when Castor Oil shall be manufactured there, not only for home consumption, but for export from the Islands—a rival even to "the cold-drawn East India oil."

Mustard (sinapis) grows wild over considerable tracts. I am not aware that it is at all used, even as a condiment, though, no doubt, possessing requisite strength. Mustard is even imported for the tables of foreign residents.

The Pomegranate (punica granatum) has been brought to maturity on the Sandwich Islands, and is, no doubt, still cultivated by those of horticultural tastes. The rinds of the fruit (malecorium,) and the flowers (balaustines,) may yet be valued among the rural inhabitants for their astringent and tonic properties; though, if it be true, as before stated, that verminous affections are rare, the famed properties of the bark of the root may not be called into requisition.

The Stramonium (datura stramonium,) introduced many years since, now propagates itself, and was, about Honolulu, the nuisance of my boyish days. This powerful narcotic, so identical in its effects with belladonna, though by no means to be employed as a popular remedy, may yet be made valuable to the Island practitioner.

Several members of the genus *Citrus*—*The Orange* (c. aurantium,) *The Citron* (c. medica,) *The Lemon* (c. limonium,) *The Lime* (c. acris)—which are, I believe, all introduced, form an important group. The orange was first planted on the Islands by Capt. Vancouver, 1792. As a fruit, they have already became quite an article of export. In 1849, 10,000 were exported, and in 1850, 139,500. I know not why the Sandwich Islands may not produce the much sought orange flower water (aurantii floris aqua,) used both in the toilet chamber and the apothecary's shop; and if the flowers of the Seville or bitter orange (citrus vulgaris) be preferable, it can, no doubt, be added to the Island Flora.

The oil, or neroli (aurantii oleum) will, no doubt, possess as fine a scent as that of France or Italy. Three hundred and four gallons of lime juice (limonus succus) were exported in the year ending June 30th, 1855.

Cotton (gossypium.) This article, so useful in burns, grows well, and is of good quality. It has not become an article of export.

Wheat (triticum.)

Oats (avena sativa.) These two grains, officinal in the Pharmacopœia, and of such noted importance in other departments of civilized life, are every year becoming more important articles of culture for home consumption.

Coriander (coriandrum sativum.) *Fennel* (fœniculum vulgare.) *Anise* (pimpinella anisum.) *Horseradish* (cochlearia armoracia.) *Cayenne Pepper* (capsicum.) *Black Pepper* (piper nigrum.) *Rhubarb* (rheum.) *Lettuce* (lactuca sativa.) *Sage* (salvia.) *Carrots* (daucus carota.) *The Broom* (cytisus scoparius.) *Ginger* (zingiber.) *Hops* (humulus lupulus.) *Roses* (rosa gallica.) *Poppy* (papaver somniferum.)

Aloes (aloe.) I think I am correct in mentioning this, though as yet it is only cultivated for ornament.

The Tamarind (tamarindus Indica) has long been introduced, and is a very valuable tree for the tropic zone.

Tobacco (nicotiana tabacum) has been long cultivated on the Islands, and promises to become a very important export.

Figs (ficus carica) are being more and more cultivated, and may become an important export.

The Grape (vitis vinifera) grows well in some localities, and it is now a subject of active discussion and experiment, whether it may not be extensively cultivated. Should the anticipations of some be realized, the Hawaiian Islands are to become as noted for their wines as Portugal or Madeira. Thus, to repeat Edmund Burke's witticism, the Sandwich Islands producers are aspiring to the rights of kings, viz.: to the "*jus de vinum.*" While the *Grapes* are cultivated for luxurious contributions to the table, and while the *Raisins* are dried for the home and foreign markets of future days, as medical men, we may "hope against hope," that *Hawaiian Wines*, with all their variety and excellence, shall be manufactured for the Materia Medica rather than for the Materia Alimentaria.

RESEARCHES ON THE CONSTITUTION OF QUININE.

By Adolphus Strecker.

(Translated from the Annalen d. Chemie und Pharm., August, 1854. By J. M. Maisch.)

The importance of quinine as a remedy, the increasing difficulty of obtaining it in sufficient quantities from the Peruvian barks, and in consequence thereof, the increase of the price of it, which will still rise with the increasing clearing of the cinchona forests; all this has given a new incitation to the hope entertained by scientific men to obtain quinine artificially, the more so as several rewards have been offered for such a discovery. The interesting researches by A. Wurtz and A. W. Hofman, which have made us acquainted with a large number of artificial bases, and which have thrown much light on the constitution of those bases free of oxygen, justify the hope to obtain those alkaloids which contain oxygen, in a similar manner, after their real constitution shall have been ascertained by future researches.

The chemical properties of quinine, notwithstanding its great importance, are still less known than those of other bodies of much less interest. Not even on the per-centic composition, much less on the chemical formula, do the chemists agree. With regard to its constitution there has hardly been dared to venture a supposition.

Before it is possible to "compound" quinine, the per-centage of its elementary constituents, its equivalent and empiric formula, its real components must be investigated and settled, and then these components must either be looked for in other organic products, or else be formed artificially.

The following may be considered as a contribution towards that end:

If the old formula $C_{60}\,H_{30}\,N_3\,O_6$, found by Pelletier and Dumas, be dropped, there are still three formulæ between which chemists are divided. Liebig expresses the equivalent of quinine by $C_{20}\,H_{12}\,NO_2$; Regnault calculated the formula $C_{41}\,H_{25}\,N_2O_4$, which, corrected in accordance with the real equivalent of carbon, is $C_{40}\,H_{24}\,N_2\,O_4$; Laurent obtained the formula $C_{38}\,H_{22}\,N_2\,O_4$. The first two are alike in per-centage, and differ only in the equivalent; but the last one differs materially from the former.

Without at first paying any attention to the equivalent of quinine—as Liebig and Regnault agree not only on the (per-centage) composition of it, but also of its salts—the question remains to be solved, whether $C_{38}\ H_{22}\ N_2\ O_4$ or $C_{40}\ H_{24}\ N_2\ O_4$ expresses the real composition, and this may be done by experiment, independently of any theory whatever.

Liebig and Regnault, in their analyses by combustion, used oxide of copper, by which, however, the complete combustion of bodies with a large amount of carbon is unreliable; Laurent added oxygen to the same. The analyses of these three chemists, however, agree in the amount of carbon. Some time ago Wertheim published that, according to his analysis, quinine contained 20C (or 40C) and not 19C (or 38C) as Laurent thinks. Wertheim's experiments, however, not having been further promulgated, are therefore useless in coming to a decision.

To obtain pure quinine, I have precipitated sulphate of quinine by ammonia, washed and dried the precipitate, treated it with ether, until most of the quinine was dissolved. The solution was evaporated, the residue again treated with a little ether, this evaporated, the residue dried at first under the air-pump and afterwards at 120°C. (248°F.) The combustion was carried on with oxide of copper and oxygen, the open extremity of the tube containing metallic copper. The following were the results:

0·2912 grm. gave 0·7905 grm. carbonic acid and 0·1970 water.
0·2798 grm. " 0·7600 " " 0·1890 "

These results I put alongside with those of Liebig, Regnault and Laurent.

Calculated.		Obtained.						
		Liebig.		Regnault.	Laurent.		Strecker.	
C_{38} 73·5	C_{40} 74·1	74·2	73·3	73·5	73·3	73·5	74·0	74·1
H_{22} 7·1	H_{24} 7·4	7·6	—	7·6	7·1	7·1	7·5	7·5
N_2 9·0	N_2 8·6	8·1	—	8·5	—	—	—	—
O_4 10·4	O_4 9·9	—	—	—	—	—	—	—
100·0	100·0							

My analyses place beyond any doubt the formula with 40C to be the right one, and the following experiments give further evidence:

The analyses of the double-salt with chloride of platinum are in favor of the formula with 40C. Liebig found 26·5, 26·6 and 26·6 p. c. platinum. Laurent and Gerhardt 26·3 to 26·6 p. c. The formula $C_{40}H_{24}N_2O_4+2HCl+2PtCl_2$ wants 26·9 p. c., but the formula $C_{38}H_{22}N_2O_4+2HCl+2PtCl_2$ 27·4 p. c. platinum. The addition of water to the formula, as Laurent did, reduces the amount of platinum, but there is no evidence at all of its containing such.

As further proof of the selected formula, I may mention the following analyses :

Nitrate of Quinine. If the officinal sulphate of quinine is mixed with nitrate of baryta, and the resulting solution evaporated spontaneously, large transparent prismatic crystals are formed, which were recrystallized from boiling water. 0·5865 grm. air-dry crystals lost, at 100° Cent. 0.0245 grm. water. 0·2726 grm. dried at 100° C. gave 0·6205 grm. carbonic acid and 0·1615 grm. water, which leads to the following formula : $C_{40}H_{24}N_2O_4, HO, NO_5+2HO$.

			Calculated.		Found.
40 equiv.	C	- - -	240	62·0 - - -	62.1
25 "	H	- - -	25	6·5 - - -	6·6
3 "	N	- - -	42	— - - -	—
10 "	O	- - -	80	— - - -	—
			387		
2 "	HO	- - -	18	4·4 - - -	4·2

I could not obtain another nitrate in crystals with more nitric acid.

Sulphate of Quinine. The officinal sulphate contains 7 equiv. (Regnault) of water of crystallization; according to Robiquet 8 equiv. Owing to its efflorescence on exposure to the air, it is difficult to obtain it at all times with the same amount of water. After exposure to dry air it retains, according to Robiquet, still 2 equiv. of water, which statement I can confirm as results of my experiments. For this reason it seems to me proper to consider the effloresced salt as the officinal, as this only might in the shops be found of the same composition.

I. 1·9285 grm. air-dry salt lost, at 120° C., 0·0895 grm. water.

II. 2·0910 grm. air-dry salt, of another crystallization, lost, at 120° C., 0.0965 grm. water.

III. 1·1415 grm. dried at 120° C., formed 0·3575 grm. sulphate of baryta.

IV. 0.7915 grm. dried at 120° C., gave 0·2500 grm. sulphate of baryta.

The formula of the air-dry salt is, accordingly, $C_{40} H_{24} N_2 O_4$, HO, SO_3+2HO.

	Calculated.		Found.	
			III.	IV.
$C_{40} H_{25} N_2 O_5$	333	89·3	—	—
SO_3	40	10·7	10·7	10·8
	373	100		
			I.	II.
$C_{40} H_{25} N_2 O_8 S$	373	95·4	—	—
2HO	18	4·6	4·6	4·6
	391	100		

Nitrate of Silver and Quinine. On addition of nitrate of silver to an alcoholic solution of quinine, the formation of a crystalline precipitate takes place which, after being washed with alcohol, is dissolved in boiling water. On cooling, the solution thickens to a paste-like mass, in which, after a short time, small colorless crystals are formed, the liquid subsequently becoming thin, like water.

1·2725 grm. air-dry crystals lost, at 110° C., 0·0280 grm. water, or 2·2 per cent.

1·4040 grm. crystals, dried over sulphuric acid, lost, at 110° C., 0·0240 grm. water, or 1·7 per cent.

0·7635 grm. salt, dried at 110° C., gave 0·1868 grm. chloride and 0·0265 grm. metallic silver, or 21·6 per cent.

Consequently, the formula of the crystals is $C_{40} H_{24} N_2 O_4+AgO$, NO_5+HO, from which 1·8 p. c. water, and, in the dry salt, 21·9 p. c. silver is reckoned.

The crystals are sparingly soluble in cold water at 15° C.; 100 grm. water dissolves but 0·35 grm. of them.

After the settlement of the question regarding the composition of quinine, it was still uncertain which was its equivalent. There is much inconsistency displayed regarding the term equivalent;

sometimes it is used to express the weight of equal activity, sometimes to denote the molecule or atom. Thus, the equivalent of phosphoric acid is expressed by PO_5, while this is equal to 3 equiv. of sulphuric acid, and thus is a sign of 3 equiv. of acid. In the same manner the equivalent of oxide of iron is given as Fe_2O_3, and this quantity takes the place of 3 equiv. of potassa or similar oxides, and therefore expresses 3 equiv. of base. If that quantity which may replace 1 equiv. of potassa (KO) is called 1 equiv. of base, the question arises whether the same must be expressed by $C_{20}H_{12}NO_2$, or by $C_{40}H_{24}N_2O_4$. For the first value we set Ch, for the last Ch′, then the composition of the most important salts of quinine is as follows:

$Ch = C_{20}H_{12}NO_2$	$Ch' = C_{40}H_{24}N_2O_4$
$Ch+SO_3+HO$	$Ch'+2(SO_3+HO)$
$2Ch+SO_3, HO$	$Ch'+SO_3, HO$
$Ch+HCl$	$Ch'+2HCl$
$2Ch+HCl$	$Ch'+HCl$
$Ch+HCl+PtCl_2$	$Ch'+2HCl+2PtCl_2$
$2Ch+NO_5, HO$	$Ch'+NO_5, HO$
$2Ch+NO_5, AgO$	$Ch'+NO_5, AgO$

In inorganic chemistry (which frequently is taken to be the type of organic chemistry) no combinations are known which, for 1 equiv. of base, contain 2 equiv. of chloride of platinum; therefore, most chemists call 1 equiv. that amount of an organic base which unites with 1 equiv. of chloride of platinum to form a double salt. But this does not decide whether chloride of platinum may not combine in other proportions with chlorides and muriates, and some chemists do believe that 1 equiv. of base can unite either with 1 equiv. of hydrochloric acid and 1 equiv. of chloride of platinum, or with 2 equiv. of each. But on the other hand, it is to be remarked as favorable for the second formula, that the salt $Ch'+SO_3\ HO$ has a neutral, and the salt $Ch'+2(SO_3, HO)$ an acid reaction. If the former was a basic salt, as the first theory teaches, it ought to have an alkaline reaction, like quinine, and it is hard to believe that the neutral salt of so strong a base should have an acid reaction, as is the case with the salt $C_{40}H_{24}N_2O_4, 2(SO_3, HO)$.

From the foregoing, it is obvious that chemists come to a dif-

ferent conclusion in accordance with the weight they attribute to one or the other reason, and it might be difficult to decide the question in this way. But the following experiments I believe will much more insure a decision.

(To be continued.)

ON NASCENT MANURES.

By David Stuart, M. D.

Chemist of Maryland Agricultural Society.

Reasoning from analogy, all manures must be presented to the plant in the nascent state in order to their assimilation; but a safer proposition, perhaps, would be, that many elements of plants, while they exist in their normal or natural condition, are as perfectly unassimilable, or as incapable of affording nourishment to them, as they are to animals.

A hundred illustrations of this law will at once occur to every intelligent mind; and the facility with which even inorganic compounds unite while in the nascent form, is familiar to all. Every molecule of matter, whether composed of compound or simple atoms, seems to have a form of its own, and until it has assumed this form, or state of aggregation it is in the nascent state, or in an allontropic condition.

While in this nascent state, its tendency to unite with other bodies which have an affinity for it, is wonderfully increased; indeed, it is often the only condition in which two substances will combine. The celebrated Farraday attaches so much importance to this nascent, as contrasted with the normal condition, that a few months since he expressed the opinion that ozone is merely oxygen in the nascent, or allontropic condition.

Lime and Magnesia, when recently slacked, are capable of uniting with other substances; if, however, the slacked lime or magnesia is kept for a long time, even although perfectly excluded from the air, it will gradually assume the form of granules, and subsequently these molecules will form crystals, or the lowest order of organisms; and these organs seem to possess a degree of resistance to external force analogous to the resistance of the higher organisms; indeed, the more perfect crystals of the same

substance and in the same solution, will grow and become more perfect, at the expense of those which are irregular. Upon this principle, the imperfect crystals may be said to be approximating to the allontropic condition, or nascent state, while the perfect crystal is in the normal condition.

It may be said that extent of surface is one of the causes of this, and a better illustration is sand, or quartz, which is perfectly insoluble in its natural or normal condition, however fine the powder, even in some of the strongest acids. But sand or silica is frequently found in the nascent condition, and then it dissolves readily in water; moreover, it can be kept in this condition for years; but if heated to the temperature of 260° it assumes its normal condition, and becomes perfectly insoluble even in acids; whereas before, it would dissolve in acids, alkalies, or pure water.

Lime and Magnesia, while in the caustic state, are capable of converting sand into soluble silica; and this is perhaps one of the good effects of liming, especially when we consider the remarkable influence that soluble silica exerts in absorbing ammonia from the atmosphere, and also from ammoniacal manures. We may also account thus for the crumbling of stable walls, the moist condition of old walls, and especially those that are exposed to ammoniacal exhalations. Moreover, we have a plausible mode of accounting for nitre beds, and the remarkable value of old plaster; also the purifying influence of "White-washing," if it is done with caustic lime, and not with whiting or carbonate of lime. Lime, while caustic and moist, in contact with sand, converts a small part of the surface of the grains of sand from the soluble to the insoluble silica; and this is the reason why caustic lime is necessary to the formation of good mortar, as it is not (as is almost universally supposed) a mere mechanical mixture of lime and sand, neither is it grains of sand cemented together by the induration of lime, but the actual solution of the surface of the grains of sand produces a still more intimate union.

Well, this soluble silica gradually absorbs from the atmosphere the ammonia, for which it has a remarkable affinity; and as ammonia is the vehicle of poisonous exhalations of disease, as well as the perfume of flowers, these exhalations are so concentrated upon the walls of hospitals, that it sometimes becomes neces-

sary to remove the plastering, in order to get rid of erisypelas and other diseases.

Nearly, or quite all of the nitric acid of commerce, was no doubt originally derived from ammonia in the order above referred to, for, if my theory as above stated is admitted, then, every authority will sustain me in saying that old plaster contains ammonia, and this ammonia is converted into nitric acid on the wall. Salts of nitric acid can be seen by any one on the surface of old walls. Moreover, the leachings of old walls have frequently been used in the manufacture of gunpowder, and old plaster always enters into the composition of artificial nitre beds.

It will be readily admitted that silica can never enter the rootlet of a plant, however fine the powder, unless it is in solution, and that the finest powder of sand or silica differs as much in solubility from nascent silica, as sand differs from sugar. The importance, then, of soluble silica to grasses and wheat, and especially to corn, and, indeed, its value as manure has long been recognized; (see Liebig's Chemistry, Am. Ed. 1841, p. 200.)

It was first supposed that potash was the vehicle for its conveyance to every part of the plant; but the modern idea is, that ammonia is the main instrument of its conveyance; certain it is that it loses its base at the instant of its deposition on the stem; and if potash were the base, then it would be necessary that the potash be carried back again to the earth, and the plant would be constantly embarrassed by excrementitious matter; whereas, the ammonia being volatile evaporates, and leaves the glassy coating, or element of strength, on the surface of the stem. Thus, it is found that more ammonia is actually exhaled from plants, than we ever give them in the form of manure; and it is strongly suspected that soluble silica is really the manure, while ammonia is merely the vehicle for the conveyance of soluble silica through the plant.

When the carcass of an animal falls in a field, the luxuriant grass or grain " falls," on account of the absence of the relative amount of soluble silica, or the excess of ammonia uses up at once all of this necessary element that is available.

Two years since, I manured two lands in the centre of my oats field, the one with Peruvian Guano, the other with soluble silica,

leaving a land unmanured between. The proportion of straw on the guanoed land was very much increased, but last summer, the same field was in wheat, and a corresponding diminution in the proportion of straw was noticed on the land that had been guanoed two years since; and what is more remarkable, the lands on each side of the guanoed land, averaged 746 lbs. more of wheat straw per acre, although no manure of any kind had been applied to either since it was in oats. Whereas, the silicated land not only produced more straw than either of its unmanured neighbors, but also excelled the guanoed land in wheat nearly three bushels per acre, and ripened earlier than any other part of the field.

The difference between the silicated land and the unmanured, averaged 1966 lbs., while it also produced nine and one tenth bushels of wheat more than the adjoining unmanured lands.

A land of my oats field of last summer, exhibited the same increase in the weight of the straw, although no silicates have been applied since it was in corn two years since.

But the most remarkable result was obtained in my corn field of this year, where the corn on the silicated portion averaged 93 lbs. per shock, while the part unmanured only weighed 42 lbs. per shock; each shock represented 64 hills of corn, and the average of 31 shocks was taken. This manure was applied in my presence, and I personally gathered and weighed the produce of each separate shock in the field, with my own hands; therefore, I can vouch for the correctness of the results. And now, can we not account for the well known and remarkable efficacy of dissolved bones on this principle, when compared with normal phosphate of lime, whether it be in the form of bone-ash, ground bones, or phosphate guano?

"Bones have been used with profit, at the rate of $20 to $60 per acre;" and it has been repeatedly demonstrated that one bushel of dissolved bones, for immediate effect, is equal to five times as much ground bones; in other words, that one pound of nascent or soluble phosphate of lime, is worth more than five pounds of normal or natural phosphate of lime, or bone earth. It will be admitted that every acre of land on the face of the earth, contains from one-tenth of one, to 4 per cent. of lime, and magnesia; and if only *one*-tenth of one per cent, at the depth of cultivation, even then, each acre must contain 1500 to 2000 lbs. of

lime and magnesia. Now, it is manifest if 10, or even 30 bushels of dissolved bones were applied to the acre, the first rain would convert all of the free phosphoric acid, or bi-phosphates that they contain, into neutral nascent sub-phosphates; and it is, therefore, nascent sub-phosphate of lime, that is taken up and assimilated by the plant. Thus, we are enabled to account for the wonderful effects of what are called in commerce, bi-phosphates, which really contain very little free phosphoric acid, but all of the phosphoric acid exists as neutral nascent phosphate of lime.

The fact is, that dissolved bones are unmanageable as a manure in this country, [in England bi-phosphates are applied in solution,] until reduced from a fluid to the form of a powder, by the means of ivory-black, guano, or some less valuable diluent; and the universal distribution of carbonate of lime, etc. in these, converts nearly all of the bi-phosphates into neutral nascent phosphates or sub-phosphates. During the past summer, I have been experimenting on two separate fields, with four of these compounds, two of which were made in New York, and two in Baltimore; the most remarkable results were obtained from experiments made upon a few hills of corn. But I will confine my statement to two series, where whole rows of shocks were compared with contiguous unmanured rows; the average of 23 shocks, each shock representing 64 hills, exhibited a difference of about 25 per cent; or the manured 42 lbs. per shock; and these manures were applied in my presence, at the rate of ten bushels per acre broadcast, and I gathered and weighed the corn in the field myself.

Now, it is most probable that no atom of free phosphoric acid, or bi-phosphate of lime, ever enters the rootlet of a plant without destroying it; and, having proved that a solution of bones would necessarily become precipitated in contact with any soil, we are driven to the conclusion that this precipitate or nascent sub-phosphate is *the* valuable manure, and we take it for granted that it will preserve the nascent form for some time in moist situations, as we know that moist oxide of iron will continue to preserve this form, as the antidote for arsenic, for weeks together. Ultimately, however, it also loses the nascent and assumes the normal form, and becomes so insoluble, that five times the dose is required, in order to afford the soluble material for the same proportion of ar-

senic. Thus it is with phosphate guanoes and bone dust; none of them are absolutely insoluble in pure water, and when thus dissolved as sub-phosphates, they are converted into the nascent form, and more readily redissolved than before their solution.

The contact of a piece of wood or string, has been known to hasten the solubility of the most insoluble substances; for instance, the inner part of a metallic worm of a still, opposite a wooden support has been known to dissolve in the distilled waters passing through it, and the same remark is made with regard to hydrant pipes; the normal condition of insoluble bodies is then disturbed, and the allontropic or nascent condition produced, by contact with vegetable substances in a state of change; this, then, may account for the influence of organic manures, and indicates the philosophy of the modern plan of manuring in Europe, which is by hauling out the manure on the field, load by load, as it is generated, instead of permitting it to ferment in heaps in the stable yard. Now, query, would it not be still better to stratify it with powder of feldspar, phosphorite, or phosphatic guano, and concentrate this disturbing force of fermentation upon the elements, which, when reduced to the nascent state, are worth more than the one or two per cent. of alkalies, etc. in the manure itself.

It is still a question with physiologists whether nitrogen is ever assimilated by plants, much less by animals, in its normal condition; and it is a curious fact, that both the plant and animal may starve, when fed on carbonaceous food exclusively, although both are bathed in an atmosphere containing four-fifths of nitrogen, which is perfectly useless to both, because not presented in the nascent form.—*American Farmer.*

Baltimore. Jan. 24th, 1855.

ON THE PRODUCTION OF OPIUM IN ASIA MINOR.

By Sidney H. Maltass, Esq.

No crop is more uncertain than opium, as the poppy from which it is produced is liable to be injured, and even destroyed by spring frost, drought, or locusts. Winter snows and a mild rainy spring are most favorable to its growth. The poppy requires a naturally moist and rich soil, further improved by large

quantities of manure: the fields in which it is grown are repeatedly ploughed until the soil is completely pulverized. The seed is sown immediately after the first autumn rains until November, and in the highlands even later. It is sown broadcast mixed with sand, to avoid throwing too large a quantity. A *toloom* or hide of land (1600 square yards) requires from one-fourth to one third of an *oke*, that is about three-fourths to one pound weight of seed. After the seed is sown, a harrow peculiar to Turkey is passed over the field; this harrow consists of planks nailed together, forming a square of about four feet, to which are harnessed one or two oxen; a man stands upon it, and drives the team over the field.

Early in the spring, when the plants have acquired some strength, hoeing and weeding commence, and continue until the flowering season; this occupation devolves principally on the women and children, who are all employed. It is not customary for large landed proprietors to grow opium, nor would it pay them, on account of the difficulty they would experience in procuring laborers on hire. Every peasant either possesses or rents as much land as he and his family can cultivate, and grows opium on his own account. About the end of May the plants arrive at maturity, and the flowers expand; they are mostly single, and either white or purple. A few days after the petals have fallen, the head or capsule is ready for incision. In this operation the whole family commonly take part; it is performed in the afternoon of the day, and in the following manner: A transverse incision is made with a knife in the lower part of the capsule, the the incision being carried round until it arrives nearly at the part where it commenced; sometimes it is continued spirally to halfway beyond its starting-point. The greatest nicety is required to avoid cutting too deep, and penetrating the interior coating of the seed vessel, as this would cause the sap or milk to flow into the inside. The following morning the capsules are scraped and the inspissated juice placed on a leaf; if the dew has been heavy during the night the yield is greater, but the opium is dark in color; if on the contrary there has been no dew, then the yield is less, but the opium is of a lighter color. A high wind is prejudicial, as the dust raised from the pulverized soil adheres to

the exhudation and cannot be separated. The poppy capsules are cut but once, but as each plant will from one stem produce several branches, and each branch produces a flower, it is usual to pass over the field a second or a third time, to cut such capsules as were not ready at the first cutting.

The average yield of a *toloom* of land may be stated as $1\frac{1}{2}$ *chequees* of opium ($2\frac{43}{100}$lbs.) and four bushels 50 lbs. weight of seed; 3 to 5 *chequees* per *toloom* is considered a good and full crop, and under very favorable circumstances a yield of even $7\frac{1}{2}$ *chequees* has been known. The amount produced is, however, exceedingly variable, as the following report of the actual yield of one *toloom* of land in four different years will show:—

1st year, one *toloom*	produced,	of Opium,	$7\frac{1}{2}$ *chequees*
2nd	"	"	"	$\frac{1}{3}$ *chequee*
3rd	"	"	"	$2\frac{1}{4}$ *chequees*
4th	"	"	"	$4\frac{1}{2}$ *chequees*

After the opium is collected, the capsules are gathered and the seed shaken out and carefully preserved: the plants, or as they are termed the *straw*, being then given to the cattle. The seed is afterwards pressed in wooden lever-presses and the oil extracted; this oil is used by the peasants, not only for burning, but also for culinary purposes. The cake is given partly to cattle, and partly consumed by the poorer families, who pulverise it and mix it with their bread. A portion of the seed is also sold to Smyrna merchants, who ship it to Marseilles, where it is converted into oil for soap-boilers. This oil is also used as a substitute for that of linseed. The poppy seed is black, brown, yellow, or white; some districts produce more white seed than others, and it is considered to yield more oil. The average render of oil is 35 to 42 per cent.

After the opium is collected, it is wrapped in poppy leaves and dried in the shade. Before it is ready for market, a meeting of buyers and sellers takes place before the *Mudir* or Governor of every district, and the price is discussed and fixed, or as it is technically expressed *cut*, to the satisfaction of both parties—this price not being *binding* to either. The buyers or merchants advance money to the peasants at an exorbitant rate of interest, usually 4 per cent. per month; as the Turkish law does not re-

cognise more than 8 per cent. interest of money, and none at all when advanced against produce, the interest is added to the amount of the bond. The peasants are not bound to give their opium to their creditors provided they can find buyers at a higher price than that fixed, nor are the merchants compelled to take opium at the fixed rate if no one will take it off their hands.*

The duties levied are heavy: 10 per cent. are paid by the peasant for tithes, 9 per cent. by the buyer on arrival at a shipping port, and 3 per cent. more when shipped.

After the opium is purchased in the interior, it is put into thin cotton bags (which are sealed,) and these bags into circular baskets, 80 to 100 chequees (130 to 162 lbs.) being the usual weight of each ; to most of these baskets a proportion of *Chicantee* or inferior adulterated opium is added, usually about 5 per cent.; this *Chicantee* is opium mixed with sand, pounded poppy capsules, half-dried apricots, and in some instances turpentine, figs or gum tragacanth of inferior quality. The baskets are then sent to Smyrna, two on each mule, and upon arrival are stowed in damp warehouses, to avoid loss of weight; they are sold without being opened, and it is only when they reach the buyer's stores that they are opened in presence of the seller and of a public examiner.

The examiner then seats himself on the ground with an apron on and armed with a strong knife, an assistant emptying the baskets of opium before him ; he then examines it piece by piece.

*[Note by Mr. Wilkin.]—Money is advanced to the opium growers upon the security of standing crops, and it is stipulated in the bond that when the produce is collected the debt must be liquidated, either in money or produce, at the opening prices—it being optional on the part of growers to refund in money or produce. It is usual when crops have been collected, for the authorities to call a meeting for the express purpose of fixing, or as it is termed, *cutting* the prices, at which meeting growers and buyers are present. Supposing the price named at the meeting does not meet the approval of growers; but that the latter are not prepared to pay up in money, then buyers of their produce, at a higher rate than that proposed, must be forthcoming, who will engage at once to take the produce and redeem the bonds, otherwise they (the growers) must submit to the prices offered by their creditors. In the event of any competition, however the parties who have made advances are entitled to the preference, at the prices actually fixed at the meeting.

By constant practice, he can usually tell by the weight if the opium is pure, but any suspected piece is immediately cut open, and if bad thrown aside as *Chicantee;* sometimes *Chicantee* is thrust in between two pieces of good opium, and it is then cut out and thrown aside: about ten minutes are required for the examination of each basket.

The strength and quality of opium are reckoned in *carats*, like gold, 24 carats constituting pure opium; but according to custom, the examiner must pass as pure any which reaches 20 carats; all below that standard is thrown out as *Chicantee.* In purchasing opium, therefore, a difference of 20 per cent. *may* exist between the value of one basket and another, unless a previous examination be stipulated for on effecting a purchase. This condition is, however, seldom exacted when opium is intended for re-sale, as no difference of price is made in any European market for a difference of quality to this extent.

After the opium is examined, the tare is taken, including the chaffy seeds with which it was packed; these seeds, which are those of a species of *Rumex* called *Afion Oto*, or opium weed, are afterwards returned to the buyer to pack his cases. The cases are made large enough for the contents of one basket each, excepting those intended for China, which are two-thirds of the size, to facilitate their carriage across the desert to Suez.

I have observed that in London a distinction is made between Constantinople and Smyrna opium. No real difference exists. Some of the upper opium districts being at equal distances from Smyrna and the capital, the merchants who purchase in the interior send their opium to either city for sale. As Smyrna offers more advantages for smuggling, no opium has been sent to Constantinople for the last two years.

I observed, also that Landerer discovered salep powder mixed with opium shipped from Smyrna. Although I have no right to contradict so good an authority, I would suggest that the substance so discovered may have been common gum tragacanth, which is frequently used by the Jews in Smyrna, in the adulteration of opium; in fact, it is the principal substance they employ, and is cheaper than salep, and more easily procured. They make no secret of their method of adulterating, but they deny using salep, which, according to them, would be too expensive,

even at its present reduced price, and would, besides, be much more readily detected. The purest opium is collected at Ushak, Bogaditz, and Simav; but the pieces are small and stick together, which makes it unsightly.

Karahissar and its environs produce one-third the annual crop, but the quality is not so good, and the pieces are usually larger.

For the following statement of crops in different districts, and the expense attending the cultivation, &c., I am indebted to Mr. Wilkin, a gentleman who has passed several years in the opium districts, and who is well acquainted with the languages of the country.

Subjoined is a list of the opium districts, wi ththeir amount of produce in two different years—one a full crop, the other a good average, the former about 3000 baskets, and the latter 2200. Last year (1853) the crop was only 1000 baskets, and this year it is but 600.

The following is an approximate statement of the expenses which would attend the cultivation of opium by paid labor, which gives an idea of the average cost of this drug:—

Estimate of Two Crops of Opium.

		Good fair crop.		Full crop.	
Karahissar district.	Karahissar	400	baskets	500	baskets.
	Afion Cassaba	50	"	100	"
	Sandukli	200	"	250	"
	Sitchanli	60	"	80	"
	Karamuk	25	"	30	"
	Tzai	30	"	40	"
	Bolavadin	50	"	60	"
	Ushak	250	"	400	"
	Ishikli	100	"	200	"
	Ekmé, Takmak, Coullah	100	"	200	"
	Tzal, Baklan	80	"	100	"
	Simav, Ghediz, Eneòvassi, Taouchanli	200	"	250	"
	Kutayah	40	"	50	"
	Boladitz, Eskihissar	30	"	50	"
	Ak Shair	250	"	300	"
	Yalavatz	250	"	300	"
	Karagatz, Sparta, Bourdroun	150	"	200	"
		2265		3110	

Calculation of the average expense and result of cultivating 100 Toloom**s** *of land with Opium, provided labor could be procured by usual wages.*

PRODUCE.	Piasters.
100 *Tolooms* of land—average yield of opium at 1½ *chequee per toloom*=150 *chequees*, at piast. 80 . .	12,000
Average yield of seed, 4 bushels per *toloom*=400 bushels, at P.* 20	8000
	20,000

EXPENSES.	Piasters.	
Tithes, 10 per cent. on value of produce . .	2000	
Ploughing, 118 days, at p. 8	944	
Manure, 5000 loads (donkey) at p. 1 per load .	5000	
Seed, 36 *okes* or 2 bushels, at p. 20 . . .	40	
Hoeing, weeding, &c., 400 days, at p. 8 . .	3200	
Making incisions . 200 " p. 8 . .	1600	
Gathering . . 100 " p. 8 . .	800	
Collecting seed . 100 " p. 8 . .	800	
Cleaning . . 100 " p. 8 . .	800	
Cattle food, &c.	240	
		15,424
Average gain to a grower . . .		4,576

The foregoing statement regarding the expense of cultivating the poppy and its yield of opium in various years, must be regarded as *approximative* only, as it has been obtained from ignorant peasants, who are never exactly correct, especially in figures. In Turkey there are *favorite* numbers amongst the peasants, 100 and 40 being those mostly used; 10, 20, and 5, are also favorites.

Presuming the grower should send this opium to Smyrna for sale, the cost would be as follows:—

	Piasters.
150 *Chequees*, at piast. 80	12,000
Packing charges	20
Inland duty at p. 5 1-10th per *chequee* . . .	825
Carriage	300
Loss on money by bills, 2 per cent.	240
Factor's commission in Smyrna, 2 per cent. . .	200
Brokerage 1 per cent. on p. 100	100
	13,685

* "P." signifies *Piaster*. A Turkish piaster is worth about 2 1-5th*d*. sterling.

This shows a cost of p. 91.23 per chequee,
to which add . 9.00 " shipping charges to Europe

P. 100.23

Or, at the exchange of 110 piasters for £ sterling and usual equivalent per *chequee* of 1 $\frac{62}{100}$ lb avoird., it would cost 11*s.* 1*d.* per lb. free on board; add charges in England, insurance, freight, &c., 5*d.*=11*s.* 6*d.*

This year (1854) the crop of opium being only 600 or 800 baskets, the price at present (October, 1854) is p. 140, or 16*s.* 2*d.* per lb. on shipboard; but were it not for the revolution in China, which diminishes the demand for that country, the price would be fully 20*s.*

The average price of opium in Smyrna is p. 100 per *chequee* of 1 $\frac{62}{100}$ lbs.; to this added for commissions and duties, &c., 9 per cent., would give an average value in sterling of 12*s.* per lb. on board ship. The exchange on London varies from p. 110 to p. 115 per £ sterling.

This price of p. 110 must be reckoned when the crop is fair, say about 2000 baskets; an increase on this quantity would reduce prices below p. 100, until a crop of 3000 would make prices fall to p. 60 per *chequee*, or about 7*s.* 2*d.* per lb., including shipping charges.—*London Pharm. Journal, March*, 1855.

ON THE PRODUCTION OF ALCOHOL FROM BICARBURETTED HYDROGEN GAS.

By M. Berthelot.

I. 1. A large balloon, capable of containing 31 or 32 litres, was filled with pure bicarburetted hydrogen gas; 900 grms. of pure boiled sulphuric acid were then added in several portions, followed by several kilogrammes of mercury, and the whole was then violently shaken for a long time. The gas was gradually absorbed. After 53,000 shocks, the absorption becoming very slow, the operation was stopped; 30 litres of the gas were absorbed. 5 or 6 vols. of water were added to the sulphuric acid, and this was distilled; by repeated distillations and separations by means of carbonate of potash, 52 grms. of alcohol were at last obtained, representing 45 grms. of absolute alcohol. This

weight represents three-fourths of the absorbed gas. The remainder was lost in the manipulations.

2. This alcohol presents a somewhat pungent and aromatic spirituous taste and odor, similar to that which is met with in the distillation of the sulphovinates. It distils almost entirely between 174° and 178° F. It burns without residue, with the usual flame of alcohol. It dissolves chloride of calcium in abundance, and mixes with water in all proportions.

3. A quantity of this alcohol corresponding to 3·1 grs. of absolute alcohol, distilled with sulphuric acid and sand, furnished 1·5 litre of gas containing 1·25 litre of pure olefiant gas, that is to say five-sixths of the quantity of olefiant gas represented by this weight of alcohol. These results agree with those furnished by ordinary alcohol.

The olefiant gas thus prepared possesses the normal properties; it is absorbed by ordinary sulphuric acid (3000 shocks), by bromine, and by iodine, forming the characteristic solid iodide. When collected at the proper moment, it furnished by detonation 2 vols. CO^2, absorbing 3 vols. of oxygen.

4. 10 parts by weight of my alcohol (regarded as absolute alcohol) distilled with a mixture of sulphuric and acetic acids, furnished 20 parts of crude acetic ether. Calculation gives for 10 parts of alcohol, 19 parts of anhydrous acetic ether. This ether, treated with potash at 212° F., was rapidly decomposed, reproducing acetic acid and alcohol, with a perfectly normal odor. The alcohol was reconstituted in this manner for the third time.

5. These characters appear to leave no doubt as to the nature of the liquid prepared with olefiant gas. To arrive at greater certainty, the experiments were varied as follows:—

1. The olefiant gas was collected in a gasometer filled with concentrated sulphuric acid. The gasometer, still containing a fourth of the sulphuric acid, was quickly shaken for several minutes; the gas was then passed through mercury into bottles of a litre capacity, and absorbed by boiled sulphuric acid. The complete absorption of the gas required 3000 shocks to each bottle.

2. Olefiant gas, collected and purified in a gasometer filled with sulphuric acid, was passed slowly through fuming sulphuric

acid contained in a Liebig's tube. A portion of the gas escaped the action of this fluid, and this portion was absorbed by shaking with ordinary sulphuric acid.

3. Olefiant gas was prepared by the action of mercury and muriatic acid upon its iodide,—

$$C^4 H^4 I^2 + 4Hg = C^4 H^4 + 2Hg^2 I,$$

and the gas was absorbed by sulphuric acid.

The sulphuric acid combined with the gas in each of these three operations, was saturated by carbonate of baryta or lime; in this manner sulphovinates were produced.

6. The baryta salt analysed presented the ordinary composition,—

$$S^2 O^6, C^4 H^4, HO, BaO + 2Aq.$$

Judging from its properties and crystalline form, this salt is identical with the variety of sulphovinate of baryta which is stable at 212° F.

7. When distilled with acetate of soda, it furnished acetic ether; with butyrate of potash, butyric ether; with benzoate of potash, benzoic ether, $C^{14} H^6 O^4, C^4 H^4$. The latter boils at 410° F. It was analysed. Treated with potash at 212° F., it reproduced benzoic acid and alcohol. Benzoic ether was also prepared with salts produced by each of the three preceding operations.

8. The fuming acid employed in the second operation furnished a stable and deliquescent calcareous salt (isethionate), which did not yield to benzoic ether. This last observation confirms those of M. Magnus.

9. 100 litres of coal-gas were treated with iodine, and the product obtained heated with a watery solution of potash. In this manner about ¼ litre of pure olefiant gas was obtained, which produced by its combustion 2 vols. CO^2, absorbing 3 vols. of oxygen. This gas was absorbed by sulphuric acid by means of 3000 shocks; it furnished crystallized sulphovinate of baryta, and afterwards benzoic ether; the latter, treated with potash, reproduced benzoic acid and a substance possessing the properties of alcohol.

Bicarburetted hydrogen, therefore, whatever may be its origin, produces ethers and alcohol. This is the first time that alcohol has been obtained without the agency of fermentation.—*Chem. Gaz., Feb.* 1855.

ANALYSIS OF THE TUBERS OF THE CHINESE POTATO (DIOSCOREA BATATAS), CULTIVATED NEAR PARIS DURING THE YEAR 1854.

By E. Fremy.

The tubers analysed had the following composition:—

Water	79·3		
Solid matters	20·7	Starch	16·0
		Cellulose	1·0
		Mineral salts	1·1
		Albuminous matter	1·5
		Fatty bodies, sugar, soluble principles	1·1
	100·0		20·7

M. Boussingault had made a previous analysis of tubers grown at the Museum, and M. Payen of tubers from Algeria. The following are the results of these analyses:—

	Cultivated at the Museum.	Cultivated in Algeria.
Starch and mucilaginous substance	13·1	16·76
Albumen and other azotized matters	2·4	2·54
Fatty matters	0·2	0·30
Cellulose	0·4	1·45
Mineral salts	1·3	1·90
Water	82·6	77·05

By comparing these results with those of the analysis already given, it will be seen that the plants cultivated in France are actually approaching those grown in Algeria. The proximate principles of which the tubers are composed are to a great extent the same as those existing in the potato.

The Chinese potato only contains 16 per cent. of starch, whilst the potato may furnish 20 per cent.; the former, however, possesses a very remarkable azotized principle, which is not met with in the potato, and which may exercise a favorable influence upon the use of this valuable tuber. The mucilaginous principle which gives its unctuous properties to the juice of the *Dioscorea Batatas*, and which causes the pasty consistence assumed by this tuber when cooked, differs in its general properties from the gummy vegetable substances, and approaches albumen, being azotized and coagulable by heat.

This body must not be confounded with that which is often

designated as *vegetable albumen;* it does not coagulate until after long boiling, and remains in great part in a soluble state in tubers which have been boiled or dried, even at a tolerably high temperature. Thus, the Chinese potato, when cut into thin slices and dried on a stove, furnishes a product which may be reduced to powder, and which when treated with water forms a paste resembling in its plasticity that produced by wheat-flour.—*Chem. Gaz.*, Feb. 15, 1855, from *Comptes Rendus*, Jan. 15, 1855, p. 128.

ON A NEW VARIETY OF COCHINEAL—CAKE COCHINEAL.

(Obtained from Cordova, the Argentine Republic, South America.)

By James Stark, M.D., F.R.S.E.

My brother-in-law, Mr. Charles Bertram Black, when lately on a visit to some parts of the Argentine Republic, South America, had his attention directed to a dye stuff, or coloring matter, which the natives of Cordova consider of great value, and employ for dyeing cloths of all shades of red. Imagining that the substance was unknown here, and that it might be profitably imported for use in the Arts, Mr. Black procured a small quantity of it, and sent it to James Richardson, Esq., of this city. The whole information given regarding it is contained in a letter addressed to me, and dated "Santiago, April, 1854." After stating that the cake sent is a substance used for dyeing cloth all kinds of red, he says, "It is the gum which exudes from a species of cactus like the prickly pear. If Mr. Richardson thinks he can make an advantageous article of commerce of it, I can make all the necessary arrangements for him with a collector. The dye costs from 4*d.* to 9*d.* the ounce, according to the vicinity to the place where it is found."

The dye stuff, as sent home, is a solid flat cake, about a quarter of an inch thick, of a deep red color, and is marked on its surface as if it had been subjected to pressure between folds of coarse linen. The cake broke with a jagged fracture, and over the surface were seen occasional whitish spots, resembling imbedded fragments of the silver variety of the cochineal insect. A few of the strong thorny prickles of the cactus opuntia, or some similar species, were also seen projecting from the broken edges.

When a portion of the red cake was macerated in water, it swelled but did not dissolve, and then gave out a deep beautiful red color, absolutely identical with that yielded by cochineal to water. This colored solution yielded a beautiful carmine when treated with alum; in fact, this dye stuff gave all the reactions which cochineal gives, so that the two solutions, when treated by similar reagents, could not be distinguished the one from the other. When endeavoring, however, to ascertain the relative amount of coloring matter yielded by this dye stuff, and by cochineal, it appeared that it required nearly a sixth more of the red dye cake to produce a color equal to that yielded by cochineal. In other words, the cake appeared to be a sixth weaker in coloring matter than cochineal.

On examining, by means of the microscope, the solid residuum left undissolved by the water, it was found to consist almost entirely of the bodies of the cochineal insect in various stages of development. Some were nearly as large as a split pea, and were full of ova. In a few the eggs had become developed, and the mother cell, or mother insect, was left as a more or less shrivelled skin, full of perforations, through which the young had probably escaped. In both of these the color of the body appeared dark, nearly black; there were no silvery markings observable on the rings, like those seen on the silver cochineal. Fewer in number than either of the above, there occurred other cochineal insects identical in every respect with the common cochineal of commerce. Most of these were quite dark, resembling the black cochineal; others again had the silver markings as occurs in the most esteemed variety of cochineal—the silver cochineal. The bodies of the female coccus, full of ova, were by far the most common of the above; and probably from the whole having been pressed into a cake while still soft, most of the bodies were burst, and the ova, and also very minute but perfect young of the coccus, had escaped, and were floating in the water.

The presence of a few of the strong thorny spines of the cactus was evidently attributable to carelessness in gathering; and there were also observed several small fragments of the skin of the leaf of the cactus, evidently scraped off along with the insects.

The red dye cake was, therefore, nothing else than a cake of cochineal insects, collected when the females were full of ova, but also containing others in which the ova had become developed, and escaped from the mother-cell or insect. This latter fact at once accounted for its inferiority to cochineal itself as a color-producing agent. It is a well-known fact, relative to the whole of the insects which furnish cochineal, lac, and kermes, that the largest quantity of coloring matter is yielded by the mother insect before the eggs are fully developed, and that little coloring matter is yielded by those in which the eggs are fully developed or are hatched. As this cake cochineal contained a considerable proportion of females in which the ova were arrived at their full development, and several were even hatched, this satisfactorily accounted for the smaller proportion of coloring matter which the cake yielded.

We are informed that this cake cochineal—for so, I think, it may be safely termed, cost in Cordova from 4*d.* to 9*d.* the ounce; that is, from 5*s.* 4*d.* to 12*s.* the pound. As the best cochineal can be bought here for about 4*s.* the pound, this fact at once settles the question as to the profitable introduction of this red cake to this country as an article of commerce.

After the above details it is unnecessary to say that this substance is not a gum, nor an exudation from a prickly pear (or cactus) as Mr. Black has been informed it was by the native collectors. Had it been so, it would probably have been a new dye-stuff, and might have proved of much value to commerce. As it is, I think this Society will agree with me, that Mr. Black deserves the thanks of the mercantile public for bringing under their notice a dye stuff which might have been both new and valuable.—*London Pharm. Jour. Feb.* 1855.

RELATIVE FUEL-VALUE OF ALCOHOL AND WOOD-SPIRIT.

Bolley has made some comparative experiments to ascertain this point.

The wood-spirit used was slightly yellow and empyreumatic; the density was 0.81; it began to boil at 154°·4 F., and then the boiling-point rose gradually. It had a slight acid reaction, and

the color became darker on the addition of caustic soda or sulphuric acid.

The alcohol had a density of 0·845.

The apparatus employed for these experiments consisted of a lamp for the combustion of the spirit, the burner being surrounded by a cylinder eight inches in diameter, and a light brass pan supported above the flame for holding the water to be evaporated. Each experiment extended over about two hours. In each, the true quantity of water evaporated and quantity of spirit burnt were observed. The quantity of water, at 212° F., remaining in the pan was likewise observed, the quantity of steam that would have been produced by the heat thus consumed calculated, and added to the quantity of water evaporated. One fraction of the effect —the heat consumed in raising the water from 62° to 212° F. —is not included in the table below:—

		A. Consumption of fuel in grammes.	B. Evaporation of water in grammes.	Ratio of B to A.	Duration of experiment in minutes.
Wood-spirit	1.	98	514°	5·25	101
	2.	133	697	5·25	149
	3.	124	597	4·81	138
	4.	198	782	3·95	165
Alcohol	5.	160	580	4·25	104
	6.	178	781	4·38	148
	7.	133	590	4·43	119
	8.	159	687	4·32	170

In the experiments 1, 2, 3 and 6, 7, 8, the distance between the bottom of the pan and the level of the wick was always the same. In order to ascertain the influence of the greater elevation of the pan, it was raised in experiments 4 and 5 about three-quarters of an inch further from the flame. The result showed a loss in this case.

According to the first three and last three data, the heating capabilities of alcohol and wood-spirit are as 43 : 50, or nearly 6 : 7. The prices however were as 8 : 6 ; consequently the cost of evaporating a given quantity of water by means of alcohol would amount to 56, while with wood-spirit it would be only 36 ; or wood-spirit, under such circumstance, would be nine-fourteenths cheaper fuel than alcohol.—*Chemical Gazette*, February, 1855, *from Schweizerisches Gewerbeblatt*, June 1854.

ON THE PREPARATION OF PURE CARBONATE OF POTASH.

By M. Bloch.

With the view of avoiding the trouble of purifying the cream of tartar and the destruction of an equivalent of tartaric acid in the preparation of pure carbonate of potash, the author has employed the following method.

The bitartrate of potash is boiled with its equivalent of carbonate of lime. The liquid is filtered, and a few drops of nitric acid are added to it; the contained chloride is then precipitated by a few drops of nitrate of silver. The liquid is then passed through a filter moistened with water acidulated with pure nitric acid, evaporated to dryness in an iron pot, and the residue exposed to a red heat. A little water is sprinkled on the red-hot mass, in order to decompose the cyanide which has been formed. It is advisable to keep the materials constantly stirred, in order to equalize the reactions and obtain a homogeneous mass. The whole is then treated with pure water, filtered, and evaporated to dryness.

The carbonate thus prepared is perfectly pure, and contains no trace of chloride, a body which it was exceedingly difficult to get rid of by the old methods. The other advantage attending it is, that an equivalent of tartaric acid is obtained from every equivalent of bitartrate of potash employed, being thrown down in the first instance in the form of insoluble tartrate of lime.—*London Chemical Gazette, from Comptes Rendus*, Feb, 12. 1855, p. 364.

ON THE ACTIVE PRINCIPLE OF CENTAUREA CALCITRAPA.

By L. Colignon.

Centaurea calcitrapa exhibits a powerful febrifuge action. The author has endeavored to prepare its active principle. This however is not an alkaloid, and cannot be obtained in a crystalline form. It has an intense and styptic bitter taste, has a transparent amber color, and a syrupy consistence; it is not volatile, is decomposable by heat, strongly reddens litmus-paper, dissolves readily in alcohol and ether, but is only sparingly soluble even in boiling water; with potash, soda, and ammonia it forms soluble but uncrystallizable salts, and with lime and oxide of lead insoluble salts.

This substance, for which the author proposes the name of *calcitrapic acid*, is obtained in the following manner:—The coarse powder of the entire plant, collected during the time of flowering, is exhausted with alcohol in a displacement apparatus, and the fluid thus obtained is agitated with a sufficient quantity of purified animal charcoal to remove the green color. The fluid is then filtered, and eight-tenths of the alcohol distilled from it. On cooling, oily drops are formed on the surface of the fluid. It is then evaporated on the vapor-bath, when new drops are formed; these are gradually collected, and finally dissolved in ether. By the evaporation of the etherial solution, the substance is obtained with the properties already described.—*London Chemical Gazette, from Archiv der Pharm.* 2nd series, lxxx. p. 186.

CHEMICAL EXAMINATION OF THE CUBEBA CLUSII OF MIQUEL; THE BLACK PEPPER OF WESTERN AFRICA.

By John Stenhouse, LL.D., F.R.S.

A few months ago Frederick Desnaux, Esq., African merchant, kindly presented me with a quantity of these cubebs, imported, I believe, from Abbeocouta, in Western Africa.

As considerable doubt has long existed respecting the true nature of these African cubebs, most botanists regarding them as a peculiar species of cubebs, while others believe them to be a kind of pepper to which they have given the name *Piper caudatum*, or tail-pepper, I was induced to take up the subject in order to see if Chemistry could throw any light upon the matter.

The smell of these African cubebs is very similar to that of ordinary cubebs, but their taste approaches very closely that of common pepper.

The powdered cubebs were digested with wood-spirit, and the spirit drawn off by distillation. The residuum obtained in this way dissolved in alcohol, to which a strong solution of caustic potash was added. The addition of the potash lye precipitated a brown colored oil, which, on standing for some time, yielded crystals. The mother-liquor, when treated with a new quantity of potash-lye, furnished a second precipitate, from which crystals were also obtained.

The crystals, after being collected, were dried by being strongly

pressed between folds of blotting-paper, and were then repeatedly crystallized out of spirit of wine. The crystals purified in this way were of a considerable size, being about a quarter of an inch in length and nearly colorless. Their form was that of oblique, four-sided prisms, precisely similar to piperine. They are very soluble in hot spirit of wine, pretty soluble in ether, but insoluble in water. When distilled with caustic potash they yield a volatile base, which has the characteristic odor of piperidine.

The subjoined analysis of these crystals demonstrates that they are identical with piperine:—

I. 0.2160 grms. gave 0.5690 grms. of CO_2 and 0.1285 HO.

II. 0.2325 grms. gave 0.6105 grms. of CO_2 and 0.1405 HO.

III. 0.5235 grms. burnt with soda-lime, gave 0.1755 platinum.

CALCULATED.	ANALYSIS.			
	Regnault.	Gerhardt.	Laurent.	Stenhouse.
C_{68} - - 71.58	71.04 - - 71.34	71.52	71.66	71.84 - - 71.61
H_{38} - - 6.67	6.72 - - 6.84	6.66	6.66	6.61 - - 6.71
N_2 - - 4.91	4.94 - - —	4.82	—	4.76 - - —
O_{12} - - 16.84				

It appears, therefore, that whatever may be the botanical characters of African cubebs their chemical properties indicate that they are really a species of pepper, containing as they do piperin and not cubebin, the non-nitrogenous crystallizable principle of the cubeb tribe, which possesses no basic properties.—*London Pharm. Jour. Feb.* 1855.

PROCESS FOR TINNING METALS.

By MM. Roseleur and Boucher.

The authors tin metals by decomposing solutions of certain double salts of tin, especially the phosphate, pyrophosphate, borate and sulphite, by means of the galvanic current. A solution for this purpose is obtained by dissolving 3 kilogrms. of pyrophosphate of potash and 500 grms. of protochloride of tin, in 200 litres of water. The temperature is raised to about 186° F.,

and the bath may be kept saturated with tin by means of anodes of tin, by the action of the galvanic current. If it be observed that the bath does not deposit sufficient metal, a certain quantity of chloride of tin may be added to it; this at first forms a white precipitate, which, however, is again dissolved. A bath of this description, which had been constantly employed for a fortnight in tinning, required no addition of pyrophosphate, so that it might be expected that nothing of the kind would be necessary even for a much longer time. This process appears to be the only one proper for protecting zinc employed in roofing, in sugar moulds and kitchen utensils, from oxidation.

Cast iron tinned in this manner exhibits a fine silver-like appearance. The fluid for this purpose is prepared with—

Distilled water or rain-water	500 litres
Pyrophosphate of soda	6 kilogrms.
Commercial tin-salt	1
Dried and fused tin-salt	1½

According to the strength of the alkaline reaction of pyrophosphate of soda, which is not always of the same composition, the quantities of the fused and acid tin-salt must be varied. The bath must be kept at a temperature of 168°–186° F. The authors consider this composition to be the best, as its slight alkalinity precludes the disadvantage attending the use of an acid bath, which is favorable to oxidation, whilst it does not, like the strongly alkaline baths, deposit the tin of a bluish color, nor require much washing to get rid of its taste.

At first the authors employed a separate galvanic battery, but it appears that this is only necessary in coating zinc with tin. For other metals it is sufficient to immerse these, previously well cleaned, in the bath, together with some pieces of zinc, when they will be covered with a dull coating of tin in the course of two or three hours. This may be polished with a wire-brush. If the coating of tin is required to be thick, the objects must be immersed several times. The bath may be used almost constantly; it is sufficient, before introducing new objects, to add 300 grms. of pyrophosphate of soda and the same quantity of the tin-salt. The pieces of zinc are gradually dissolved.

The bath employed in tinning zinc has the following composition:—

Distilled water or rain-water	600 litres.
Pyrophosphate of soda	5 kilogrms.
Dried and fused tin-salt	1 kilogrm.

Chemical Gazette, from Le Technologiste, 1854, p. 629.

ON THE COMPOUNDS OF ARSENIOUS ACID WITH IODIDE OF POTASSIUM.

By E. Harms.

Emmet has stated that a solution of arsenite of potash, mixed with sufficient acetic acid to prevent reddening of turmeric-paper, gives rise to a pulverulent precipitate of the composition $KI, 3AsO^3$, on the addition of iodide of potassium. The author has tested this statement, and found that this salt contains water, which is not dispelled at 302° F. The quantity of potassium found amounted to 8·21.

In these experiments the author has also discovered two other salts of the same kind. One of these is produced when arsenite of potash is employed without neutralization by acetic acid, the precipitate formed on the addition of iodide of potassium dissolved in boiling water, the solution mixed with 3 or 4 vols. of hot alcohol, and then treated with carbonic acid gas until a film of salt begins to be formed upon the sides of the vessel, and upon the tube through which the gas is passed. A syrupous fluid separates, containing much carbonic acid with iodine and arsenious acid. If the alcoholic solution be then further evaporated, a finely crystalline compound is obtained, with the composition $KI+3(KO\ HO, AsO^3)$. Its analysis gave,—

KI . .	26·06	25·98	1	26·32
AsO^3 . .	46·91	46·87	3	47·01
KO . .	21·35	21·15	3	22·39
HO . .	5.43	4·67	3	4·28

The 3 equivs. of water are not driven off at 212° F., and even at 526° F. the water was not expelled.

The salt is readily soluble in water and alcohol. The hot saturated solution deposits the following salt on cooling, in wart-like masses, in which no appearance of crystallization can be detected even under the microscope.

With the salts of the alkaline earths, earths and metallic oxides,

this compound behaves generally like a mixture of iodide of potassium and arsenite of potash. Concentrated sulphuric acid throws down a red or yellowish-red precipitate of iodide of arsenic. Dilute sulphuric acid, and all other acids, decompose the compound. If a current of carbonic acid be passed through the hot saturated solution, a white pulverulent salt separates, the analysis of which led to the formula KI, $HO+3AsO^3$:—

	Found.		Calculated.
KI . .	31·61	31·51	32·03
AsO^3 . .	57·67	57·43	57·17
KO . .	8 43	..	9·07
HO . .	..	..	1·73

This salt has an alkaline reaction, and when heated evolves an abundance of arsenious acid with aqueous vapor and arsenic.—*Chemical Gazette, from* Liebig's *Annalen.* p. 375.

ON THE FAT OF MYRISTICA OTOBA.

By E. Uricoechea.

The author has investigated the fat obtained by pressing the fruit of the *Myristica Otoba.* The fruits have the same taste as the nutmeg. It is employed in New Grenada, principally as an application in skin diseases of horses.

The fat, which is called *Otoba* in New Grenada, is not quite colorless; it is butyraceous, and when fresh smells like nutmeg. When fusing, it evolves a peculiar unpleasant odor. The fat melts at 100° F., whilst the fat of the common nutmeg melts at 124° F. Alcohol extracts from it a fat identical with that of the common nutmeg, with a melting point of 115° F. On saponification it furnished glycerine. The soap was dissolved in alcohol, and partially precipitated, according to Heintz's method, with acetate of magnesia; the separate precipitates were then decomposed by muriatic acid, the fatty acids washed with water, and purified by recrystallization from alcohol The acid of the first precipitate melted at 94°.5 F., that of the second and third at 95°.4 F. They were consequently identical with myristic acid, the melting point of which, according to Heintz, is 96°.8 F. (94° Playfair . The analysis also agrees with the formula $C^{28}H^{20}O^4$.

When the precipitate of myristate of magnesia has been decomposed, and the myristic acid dissolved by alcohol, a residue is left. This is a new body, to which the author gives the name of *Otobite*. After it was purified by recrystallization from hot alcohol and ether, its composition was $D^{24}H^{13}O^{5}$. It is inodorous and tasteless, insoluble in water, and crystallizes in good-sized shining prisms. It fuses at 271°.4 F., and solidifies again in a crystalline form. When heated beyond this point it solidifies in an amorphous form. Heated on platinum foil, it evolves aromatic fumes, and then burns with a smoky flame. Its analysis gave :—

Carbon	73.19	72.85	24	73.09
Hydrogen	7.35	6.46	13	6.59
Oxygen	20.46	20.68	5	20.30

London Chem. Gaz., Feb. 1, 1855, *from Liebig's Annalen.*

REACTION FOR CAFFEINE.

By Prof. W. Delffs.

If a solution of iodide of potassium and mercury, (obtained by saturating iodide of potassium with red oxide of mercury) be added to a solution of caffeine, a precipitate is produced, which in a short time forms an aggregation of shining, white, acicular crystals. The other alkaloids—cinchonine, cinchonidine, quinine, paricine, strychnine, leucine, morphine, codeine, papaverine, narcotine, delphinine, emetine, veratrine, atropine, bebeerine, aconitine, solanine, oxyacanthine, piperine, nicotine, and coniine, —also furnish precipitates with this reagent, even when diluted 60,000 times, but these remain amorphous.—*Chem. Gaz, Feb.* 15, 1855, *from Neues Jahrb. für Pharm.*

Varieties.

On Perfumery. By SEPTIMUS PIESSE.

(Continued from page 181.)

We have previously spoken of the difference in the odor between the English and French spirit; the marked distinction of British and Parisian perfumes made according to the same recipes is entirely due to the different spirits employed. Owing to the strong "bouquet," as the French say, of their spirit in comparison with ours, the continental perfumers claim a priority in the quality of their perfumes. Now, although we candidly admit that *some* odors are better when prepared with grape-spirit than with that from corn, yet there are others which are undoubtedly the best when prepared with spirit derived from the latter source. Musk, ambergris, civet, violet, tubereuse, and jasmin, if we require to retain their true aroma when in solution in alcohol, must be made with the British spirit.

All the citrine odors, verveine, vulnary waters, eau de Cologne, eau de Portugal, and eau d'Arquebuzade, Lavander, can alone be brought to perfection by using the French spirit in their manufacture. If extract of jessamine, or extract of violet, &c., be made with the French or brandy spirit, the true characteristic odor of the flower is lost to the olfactory nerve —so completely does the œnanthic ether of the grape spirit hide the flowery aroma of the otto of violet in solution with it. This solves the paradox that English extract of violet and its compounds, "spring flowers," &c., is at all times in demand on the continent, although the very flowers with which we make it are grown there.

On the contrary, if an English perfumer attempts to make eau de Portugal, &c., to bear any comparison as a fine odor to that made by Lubin of Paris, without using grape spirit, his attempt will prove a failure. True, he makes eau de Portugal even with English corn spirit, but judges of the article—and they alone can stamp its merit—discover instantly the same difference as the connoisseur finds out between "Patent British" and foreign Brandy.

Perhaps it may not be out of place here to observe that what is sold in this country as British brandy is in truth grape spirit, that is, foreign brandy very largely diluted with English spirit! By this scheme, a real semblance to the foreign brandy flavor is maintained; the difference in duty upon English and foreign spirit enables the makers of the "capsuled" article to undersell those who vend the unsophisticated Cognac.

Some chemists, who, not being very deep in the "tricks of trade," have

thought that some flavoring, or that œnanthic ether, was used to impart to British spirit the Cognac aroma. An article is even in the market called "Essence of Cognac," but which is nothing more than very badly made butyric ether.

On the continent a great deal of spirit is procured by the fermentation of the molasses from beet-root; this, of course, finds its way into the market, and is often mixed with the grape spirit; so, also, in England we have spirit from potatoes which is mixed in the corn spirit. These adulterations, if we may so term it, modify the relative odors of the primitive alcohols.

To c mplete this branch of the art of perfumery, we subjoin a few more recipestof the most popular bouquets; always considering that the standard article is that which was first introduced to the public. After a certain reputaion is gained for any particular odor, a host of imitations are thrust upon the market; these we disregard, although in some instances the imitations are superior to the original. The forms we give are according to the original text.

The recipes have been arranged alphabetically. As in the last number of the "Annals" we gave "Jockey Club," we now pass on to the

Kew Garden Nosegay.

Esprit de neroli (*Petale*)	1 pint.	Esprit de geranium	¼ pint
" cassie } from pomade	of each ¼ pt.	" musk	of each, 3 oz.
" tubereuse } from pomade		" ambergris	
" jasmin } from pomade			

Eau de Millefleurs.

Esprit de rose, triple	1 pint.	Esprit de vanilla	of each 2 oz.
" rose } from pomade	of each ½ pt.	" ambergris	
" tubereuse } from pomade		" musk	
" jasmin } from pomade		Otto of almonds	of each 10 drops.
" fleur d'orange } from pomade		" neroli	
" cassie } from pomade		" cloves	
" violette } from pomade		" bergamot	1 oz.
" rezeda, *mignonette* } from pomade			

These ingredients are to remain together for at least a fortnight, then filtered prior to sale.

Millefleurs et Lavender.		Delcroix's Millefleur Lavender.	
Esprit de lavender (*Mitcham*)	¼ pint.	Spirits from grape	1 pint.
Eau des millefleurs	1 pint.	French otto of lavender	1 oz.
		Extract of ambergris	2 oz.

The original "lavender aux millefleur" is that of Delcroix, its peculiar odor is due to the French otto of lavender, which, although some folks like it, is very inferior to the English otto of lavender; hence the formula first given is far superior to that by the inventor, and has almost superseded the original preparations.

There are several other compounds or bouquets of which lavender is the leading ingredient, and from which they take their name, such as lavender and ambergris, lavender and musk, lavender and maréchale, &c., all of which are composed of fine spirituous essences of lavender, with about 15 per cent. of any of the other ingredients.

Bouquet du Marechale.

Esprit de rose, triple } of each 1 pint.
Extrait de fleur d'orange }
Extrait de vitivert }
" vanilla }
" orris } - - - - - - ½ pint.
" tonquin }
Esprit de neroli }
Extract of musk } - of each ½ pint.
" ambergris }
Otto of cloves } - - of each ½ drachm.
" santal }

Eau de Mousselaine.

Bouquet maréchale - - - - - - 1 pint.
Extrait de cassie }
" jasmin } from } of each ½ pt.
" tubereuse } pomade }
" rose }
Otto of sandal - - - - - - - 2 drachms.

Bouquet de Montpellier.

Extrait de tubereuse - - - - - 1 pint.
" rose de pomade - - - 1 pint.
" rose triple - - - - - 1 pint.
Extract of musk } - of each ½ pint.
" ambergris }
Otto of cloves - - - - - - - - 1½ drachm.
" bergamot - - - - - ½ oz.

Caprice de la Mode.

Extrait de jasmin }
" tubereuse } of each ½ pint.
" cassie }
" fleur d'orange }
Otto of almonds - - - - - - - 10 drops
" nutmegs - - - - - - - 10 drops.
Extract of civet - - - - - - - ½ pint.

May Flowers.

Extract of rose (de pomade) }
" jasmin } of each ½ pt.
" fleur d'orange }
" cassie }
" vanilla - - - - - - - 1 pint
Otto of almonds - - - - - - - ½ drachm

Neptune, or Naval Nosegay.

Extrait de rose triple }
" santal - } of each - ½ pint.
" vitivert }
" patchouly }
" verbena - - - - - - - ½ pint.

Bouquet of all Nations.

Nations wherein the odors are produced.		
Turkey - - -	Esprit de rose, triple	½ pint.
Africa - - -	Extract of jasmin	½ pint.
England - -	" lavender	½ pint.
France - - -	" tubereuse	½ pint.
South America	" vanilla	½ pint.
Timor - - -	" santal -	½ pint.
Italy . - -	" violet -	1 pint.
Hindoostan -	" patchouly	½ pint.
Ceylon - - -	Otto of citronella	1 drachm.
Sardinia - -	" lemons - -	½ oz.
Tonquin - -	Extract of musk	½ pint.

Royal Osborne Bouquet.

Extract of orris - - - - - - - - ½ pint
" vitivert - - - - - - - ½ pint.
" santal - - - - - - - 1 pint.
" rose - - - - - - - - ½ pint.

Bouquet du Roi.

Extract of jasmin }
" violet } from } of each 1 pint.
" rose } pomade }
" vanilla - - - - - - - ½ pint.
" musk } of each - - 1 oz.
" ambergris }
Otto of bergamot - - - - - - - - 1 oz.
" cloves - - - - - - - 1 drachm

Bouquet de la Reine.

Esprit de rose } from } of each 1 pint.
Extrait de violette } pomade }
" tubereuse - - - - - - - ½ pint.
" fleur d'orange - - - - ½ pint.
Otto of bergamot - - - - - - - ½ oz.

Rondeletia.

The perfume bearing the above name is undoubtedly one of the most gratifying to the smelling nerve that has ever been made. Its inventors, Messrs. Hannay and Dietrichen, have probably taken the *name* of this odor from the *Rondeletieæ*, the *Chyn-len* of the Chinese; but the plant, as far as we can learn, yields no aroma. We have before observed that there is a similarity of effect upon the olfactory nerve produced by certain odors, although derived from totally different sources. That, for an instance, otto of almonds may be mixed with extract of violet, in such proportion that, although the odor is increased, yet the character peculiar to the violet is not destroyed. Again: there are certain odors which, on being mixed in due proportion, produce a new aroma, perfectly distinct and characteristic to itself. This effect is exemplified by comparison with the influence of certain colors when mixed upon the nerve of vision, such, for instance, as when yellow and blue are mixed, the result we call green; or when blue and red are united the compound color is known as puce or violet.

Now when the odor of lavender and odor of cloves are mixed they produce

a new fragrance, *i. e.*, Rondeletia! It is such combinations that constitute in reality "a new perfume," which, though often advertised, is very rarely attained. Jasmin and patchouly produce a novel aroma, and many others in like manner, proportion, and strength, when so mixed, must of course be studied, and the substances used accordingly. If the same quantity of any given otto be dissolved in a like proportion of spirit, and the solution be mixed in equal proportions, the strongest odor is instantly indicated by covering or hiding the presence of the other. In this way we discover that patchouly, lavender, neroly, verbena, are the most potent of the vegetable odors, and that violet, tubereuse, and jasmin, are the most delicate.

Many persons will at first consider that we are asking too much, when we express a desire to have the same deference paid to the olfactory nerve, which the other nerves that influence our physical pleasures and pains so constantly receive with homage. By tutoring the olfactory nerve, it is capable of perceiving matter in the atmosphere of the most subtle nature. Not only that which is pleasant, but also such as are unhealthful. If an unpleasant odor is a warning to seek a cleaner atmosphere, surely it is worth while to cultivate that power which enables us to act up to that warning for the general benefit of health.

To return, however, to rondeletia, it will be seen by the annexed formulæ, that, besides the main ingredients to which it owes its peculiar character—that is, cloves and lavender—it contains musk, vanilla, &c. These substances are used in these as in nearly all other bouquets for the sole purpose of fixing the more volatile odors to the handkerchief.

Essence of Rondeletia.

Spirit (brandy 60 o. p.)	1 gallon.	Otto of bergamot	1 oz.
Otto of lavender	2 oz.	Extract of musk	of each ½ pint.
" cloves	1 oz.	" vanilla	
" rose	3 drachms.	" ambergris	

The mixture must be made at least a month before it is fit for sale. Very excellent rondeletia may also be made with English spirit.

Bouquet Royale.

Extract of rose (from pomade)	1 pint.	Otto of lemons	each ¼ oz.
Esprit de rose, triple	¼ pint.	" bergamot	
Extract of jasmin } from pomade } each	¼ pint	Extract of musk	each 1 oz.
" violet		" ambergris	
*Extract of verbena } each	2½ oz		
" cassie			

Suave.

Extract of tubereuse } from pomade } each	1 pint	Extract of musk	each 2 oz.
" jasmin		" ambergris	
" cassie		Otto of bergamot	¼ oz.
" rose		" cloves	1 drachm.
" vanilla	5 oz.		

Spring Flowers.

Extract of rose } from pomade } each	1 pint.	Extract of cassie	2½ oz.
" violet		Otto of bergamot	2 drachms.
" rose, triple	2¼ oz.	Extract of ambergris	1 oz.

* Extract invariably means the solution of the odorous principle in alcohol.

The just reputation of this perfume places it among the first rank of the very best mixtures which have ever been made by any manufacturing perfumer. Its odor is truly flowery, but peculiar to itself. Being unlike any other aroma it cannot well be imitated, chiefly because there is nothing that we are acquainted with that at all resembles the odor of the esprit de rose, as derived from macerating rose pomade in spirit, to which, and to the extract of violet, nicely counterpoised, so that neither odor predominates, the peculiar character of "Spring Flowers" is due; the little ambergris that is present gives permanence to the odor upon the handkerchief, although from the very nature of the ingredients it may be said to be a fleeting odor. "Spring Flowers" is an Englishman's invention, but there is scarcely a perfumer in Europe that does not attempt an imitation.

Tulip Nosegay.

Nearly all the tulip tribe, although beautiful to the eye, are inodorous. The variety called the Duc Van Thol, however, yields an exquisite perfume, but it is not used by the manufacturer for the purpose of extracting its odor. He, however, borrows its poetical name, and makes an excellent imitation thus:—

Extract of tuberose (from pomade)	1 pint	Extract of orris - - -	3 oz.
" violet (from pomade)	1 pint.	Otto of almonds - - -	3 drops.
" rose (from pomade)	¼ pint.		

Violette du Bois.

Under the head Violet, we have already explained the method of preparing the extract or essence of that modest flower. The Parisian perfumers sell a mixture of violet, which is very beautiful, under the title of the Violette du Bois, or, the Wood Violet, which is made thus:—

Extract of violet - - -	1 pint.	Extract of rose (from pomade)	3 oz.
" orris - - -	3 oz.	Otto of almonds - - -	3 drops.
" cassie - - -	3 oz.		

This mixture, in a general way, gives more satisfaction to the customer than the pure violet.

Windsor Castle Bouquet.

Alcohol - - - - -	1 pint.	Extract of orris - - -	1 pint
Otto of neroly, rose, lavender, bergamot, each -	½ oz.	" jasmin, cassie, each - -	½ pint.
" cloves - - - -	8 drops.	" musk, ambergris, each -	2¼ oz.

Yacht Club Bouquet.

Extract of santal - - -	1 pint.	Extract of vanilla - - -	½ pint
" neroly - - -	1 pint.	Flowers of benzoins - - -	½ pint.
" jasmin, rose, triple, each -	¼ pint.		

We have now completed the branch of the art of perfumery which relates to handkerchief perfumes, or wet perfumery. Although we have rather too much encroached upon the space of "The Annals" in giving the composition of so many bouquets, yet there are many left unnoticed which are

popular. Those that are given are noted more particularly for the peculiar character of their odor, and are selected from more than a thousand recipes that have been practically tried.

Those readers who require to know any thing about the simple extracts of flowers are referred to them under their respective alphabetical titles.—*Annals of Pharmacy.*

Electro-Magnetic Engraving Machine.—This machine is somewhat on the principle of the well known planing machine. The drawing to be copied and the plate to be engraved are placed side by side, on the moveable table or lid of the machine; a pointer or feeler is so connected, by means of a horizontal bar, with a graver, that when the bar is moved, the drawing to be copied passes under the feeler, and the plate to be engraved passes, in a corresponding manner under the graver. It is obvious that, in this condition of things, a continuous line would be cut on the plate, and, a lateral motion being given to the bed, a series of such lines would be cut parallel to and touching each other, the feeler of course passing in a corresponding manner over the drawing. If then, a means could be devised for causing the graver to act only when the point of the feeler passed over a portion of the drawing, it is clear we should get a plate engraved, line for line, with the object to be copied. This is accomplished by placing the graver under the control of two electro-magnets, the one to draw the graver down to the plate, the other to press it down on it. The coil enveloping one of these magnets is in connection with the feeler, which is made of metal. The drawing is made on a metallic or conducting surface, with a rosined ink, or some other non-conducting substance. An electric current is then established, so that when the feeler rests on the metallic surface, it passes through the coils of the magnet, and causes it to lift the graver from the plate to be engraved. As soon as the feeler reaches the drawing and passes over the non-conducting ink, the current of electricity is broken, and the magnet ceases to act, and by a self-acting mechanical arrangement the current is at the same time diverted through the coils of the second magnet, which then acts powerfully and presses the graver down. This operation being repeated until the feeler has passed in parallel lines over the whole of the drawing, a plate is obtained, engraved to a uniform depth, with a fac simile of the drawing. From this a type-metal cast is taken, which, being a reverse in all respects of the engraved plate, is at once fitted for use as a block for surface printing. The machine is the invention of Mr. William Hansen, of Gotha.—*Jour. of the Franklin Institute, from the Jour. of the Soc. of Arts.*

Minutes of the College.

The Annual Meeting of the Philadelphia College of Pharmacy was held 3d mo. 26th, 1855, at the College Hall. In the absence of the President, Dillwyn Parrish, second Vice President, presided.

The minutes of the last meeting of the College were read and accepted.

The minutes of the Trustees for the last six months being called for, were read by Alfred B. Taylor, their Secretary.

The minutes of the Board informed that they have had a new seal cut according to the instructions of the College, and have thrown aside the seal formerly used on the diplomas. A suitable seal press has also been purchased.

Benjamin J. Crew, James L. Bispham, John C. Savery, Henry N. Rittenhouse, Samuel S. Bunting, and Samuel S. Garrigues have been elected to membership since the last meeting of the College.

The Degree of Graduate in Pharmacy has been conferred upon twenty-six students of the last session of the School of Pharmacy.

The Committee appointed at last meeting to distribute through Pennsylvania, New Jersey, and Delaware the "Proceedings" and "Address" of the American Pharmaceutical Association, reported the result of their labors in detail. On motion, their report was accepted, and the list of names reported by the Committee was directed to be furnished to the Executive Committee of the Association for future use.

The Annual Report of the Committee on Sinking Fund showed a nett revenue from the several sources available for that fund, which, during the past year, has enabled the Committee to extinguish six shares of the College loan, reducing the debt of the College to $400.

The College building being much in need of repair, the Committee proposed the following resolution, which was adopted:

Resolved, That the Committee on Sinking Fund be authorized to loan the Treasurer of the College, on interest, the amount in their hands, or such amount as may be required to put the College building in better condition for renting.

The Report of the Committee on Latin Labels showed that the edition of bronzed labels published previous to the last report, is nearly exhausted, and proposed the issue of a new edition with the funds now in their hands.

Of the last edition of yellow labels, 525 copies remain unsold. On motion of T. S. Weigand, the Committee was authorized to proceed with the publication as proposed.

The following Report of the Publication Committee was read and accepted:

To the Philadelphia College of Pharmacy.

The Publishing Committee respectfully report, that during the past year, the Journal has been regularly issued, extending to the second number of the 27th volume inclusive. The change in the size of the work appears to give continued satisfaction. The number of new subscribers since last report is forty-three. The contributions of original articles, although much fewer than the large number of pharmaceutists able to furnish them justifies a reasonable expectation of, are on the increase, both in number and variety, as well as from more distant localities, and lead us to be encouraged that at no distant day many of the subscribers and others will feel a pride in upholding the Scientific department of their profession, by recording the observations they may make in the course of business, as well as by pursuing regular investigations.

Through the agency of the Exchange Department of the Smithsonian Institution we have succeeded in bringing our Journal to the notice of the Society of Pharmacy at Paris, who now send their Journal in exchange. Through the same medium the Journal has been forwarded to the Apothecaries' Associations of Northern and Southern Germany, and its reception has been duly acknowledged. Several numbers were also sent to the Pharmaceutical Association of Stockholm, but as yet no acknowledgement of their reception has been received by the Committee.

As the circulation of the American Journal of Pharmacy in Europe may be the means of exciting an interest in the state of Pharmacy in the United States, and thereby enable us to exchange journals and specimens advantageously, the Committee believe that good results would accrue both to the College and its Journal, by sending a copy of the latter to every foreign *honorary member*, and to such editors of scientific journals as will be likely to exchange.

The subject of the gratuitous furnishing of the Journal to contributing and life members, referred to this Committee at the meeting in September, has received its earnest attention. After a careful comparison of the receipts and expenditures of the past year, they find, that aside from the sum of $470, (which was the balance in the treasury of the Committee at the termination of the last fiscal year,) the expenditures equal the receipts within *eighteen* dollars, notwithstanding that several extraordinary items are among the latter, arising in part from the sale of several sets of the back volumes. Consequently the regular receipts have not equalled the expenses. In view of this they are not prepared to recommend the adoption of the Resolution of Prof. Thomas, but propose the following measure in lieu of it, viz:

Resolved, That the annual contribution of the members of the College be reduced to *three* dollars; that the Journal be furnished to contributing members at *two dollars* per volume, leaving it optional with them to take it or not; and that it be sent to the life members free of charge.

The Committee believe that this arrangement will meet the wishes of members, that it will relieve the journal from any embarrassment, and at any time in the future that it may be found expedient the available excess of the journal funds can be appropriated by the College as they may be needed, just as is now done annually to the sinking fund.

CHARLES ELLIS,
WILLIAM PROCTER, JR.
A. B. TAYLOR,
EDW. PARRISH,
ROBT. BRIDGES,

Publishing Committee.

Annexed to this report was a statement of the finances of the Committee, showing receipts from subscriptions, sale of Journals, &c., $1479 23 against expenses of editing, printing, and delivering Journal, including $50 paid the Sinking Fund Committee, $1460 61. Balance now in hands of Committee $488 83.

The resolution introduced by the Committee as above, being now fully discussed, as also that of Dr. Thomas offered at the last meeting, on motion the latter was amended so as to read,

Resolved, That all the life members and contributing members not in arrears to the College be furnished with the American Journal of Pharmacy free of charge. This was finally adopted by a small majority of the members present.

On motion of Samuel F. Troth, it was unanimously

Resolved, That the Annual Appropriation of $50 from the Publication Committee to the Sinking Fund be hereafter released.

A communication was received and read, signed by Joseph Trimble, Jr., resigning his membership in the College. On motion it was accepted on the condition prescribed by our rules.

The annual election was now held, Evan T. Ellis and J. C. Savery acting as Tellers. It resulted as follows:

After the balloting had concluded, the Tellers announced the following as the results, viz.:

OFFICERS OF THE COLLEGE.

For *President* . . . . . Charles Ellis,
First Vice President . . . . Samuel F. Troth,
Second Vice President . . . Dillwyn Parrish,
Recording Secretary . . . . Edward Parrish,
Corresponding Secretary . . : William Procter, Jr.
Treasurer . . . . . . Ambrose Smith.

Eight Trustees to fill the vacancies occurring at this time.

John H. Ecky, Wm. P. Troth,
J. C. Turnpenny, Prof. R. Bridges,
Daniel S. Jones, Samuel N. James,
T. S. Weigand, John C. Savery.

Committee on Sinking Fund.

S. F. Troth, Ambrose Smith, E. Parrish.

Publication Committee.

Charles Ellis, William Procter, Jr.,
Robert Bridges, Alfred B. Taylor,
Edward Parrish.

Delegates to American Pharmaceutical Association.

Wm. Procter, Jr., H. C. Blair,
Charles Ellis, Edward Parrish,
Alfred B. Taylor.

Then on motion adjourned. EDWARD PARRISH, *Secretary*

Philadelphia College of Pharmacy.

COMMENCEMENT—1855.

The Annual Commencement of the Philadelphia College of Pharmacy was held on Thursday evening, March 22d, at 8 o'clock, in the Musical Fund Hall, in the presence of a large and respectable audience.

The Degree of Graduate in Pharmacy was conferred on behalf of the Board of Trustees, by its Presiding Officer, HENRY C. BLAIR, Esq., on the following gentlemen:

Graduates.		*Subject of Thesis.*
JAMES A. ARMSTRONG,	Pa.	Anthemis Cotula.
WILLIAM C. BAKES,	"	Spiræa Tomentosa.
JOSEPH W. BANCROFT,	"	Prinos Verticillatus.
CHARLES A. BANNVART,	Paris,	Asclepias Incarnata.
WILLIAM H. BASSETT,	Del.	Fluid Ext'ts and their preparation.
AUGUSTUS D. CARROLL,	Va.	Cimicifuga Racemosa.
JACOB DUNTON,	Pa.	Action Schuy'l Water on Lead Pipe.
CHARLES W. EPTING,	"	Caulophyllum Thalictroides.
ROBERT FAIRTHORNE,	England.	Active Principles of the Hop.
J. CLARKSON GRIFFITH,	Va.	Menispermum Virginicum.
JAMES P. HOFFECKER,	Del.	Eupatorium Perfoliatum.
M. HENRY KOLLOCK,	N.J.	Gelseminum Sempervirens.
THOMAS LANCASTER,	London, Eng.	Syrup of Nitrate of Iron.
EDMUND D. LAWALL,	Pa.	Bitter Principle of Gentian.
JAMES C. LEAMY,	Calif.	Iris Versicolor.
HERMANN LEUCHSENRING,	Paris.	Phellandrium Aquaticum.
GEORGE W. MCFEE,	Pa.	Euphorbia Ipecacuanha.
HENRY MITTNACHT,	Md.	Cocculus Palmatus.
DAVID U. MORGAN,	Pa.	Lead and its Compounds.
CHARLES W. PEDRICK,	Va.	Asclepias Tuberosa.
ELLISTON L. PEROT,	Pa.	Cassia Marilandica.
HENRY N. RITTENHOUSE,	"	Barosma Crenata.
ALONZO ROBBINZ,	"	Optical properties of Fecula.
JOHN H. RUCH,	"	Gillenia Trifoliata.
WILLIAM T. WENZEL,	Mo.	Corydalis Formosa.
JOSEPH E. YOUNG,	Pa.	Cicuta Maculata.

After the ceremony, the Valedictory Address was delivered by Prof. WILLIAM PROCTER, Jr.

By Order of Board of Trustees,

ALFRED B. TAYLOR, Secretary.

NOTICE.

TO THE PHARMACEUTISTS AND DRUGGISTS OF THE UNITED STATES.

American Pharmaceutical Association.

The 3d Section First Article of the Constitution requires the President, at least three months previous to the annual meeting, to publish a call, in all the Pharmaceutical and in such other Medical Journals as he may select, stating therein the objects of the Association and the conditions of the Membership. In compliance with this duty, you are hereby notified, that the next annual meeting of the Association will be held in the City of New York, on the second Tuesday, (11th) of September, 1855, at 3 o'clock P. M.

The objects of the Association are, to deliberate on the condition of our profession, the advancement of Pharmaceutical knowledge, and the elevation of the professional character of Apothecaries and Druggists throughout the United States.

Condition of Membership.

Section II—Article I. All pharmaceutists and druggists who shall have attained the age of twenty-one years, whose character, morally and professionally, is fair, and who, after duly considering the obligations of the Constitution and Code of Ethics of this Association are willing to subscribe to them, shall be eligible for membership.

Article II. The members shall consist of delegates from regularly constituted Colleges of Pharmacy, and Pharmaceutical Societies, who shall present properly authorized credentials, and of other reputable Pharmaceutists feeling an interest in the objects of the Association, who may not be so delegated, the latter being required to present a certificate signed by a majority of the delegates from the places whence they come. If no such delegates are present at the Association, they may on obtaining the certificates of any three members of the Association be admitted, provided they be introduced by the committee on credentials.*

Article IV. Every member shall pay into the hands of the Treasurer the sum of two dollars as his yearly contribution.

Article V. Every local Pharmaceutical Association shall be entitled to five delegates.

W. B. Chapman, President.

Cincinnati, April 11, 1855.

[* *Note by the Editor.*—The wording of the second arlicle of the constitution has been understood by many in an exclusive sense. It should be distinctly understood that all reputable Pharmaceutists and druggists, who are favorable to the objects of the Association will be welcomed at the meeting]

Editorial Department.

UNIVERSAL EXHIBITION OF 1855, AT PARIS.—Through the politeness of Dr. Alfred L. Kennedy, Chairman of the Pennsylvania Commission to the Paris Exhibition, we have received a pamphlet of 78 pages, issued by the Imperial French Commissioners, which embraces a "system of classification" to serve as a basis for the arrangement of the products exhibited, and the rules which will be observed in grouping objects in the exhibition.

The whole exhibition will be classed in two divisions, viz: I. *Industrial Products*. II. *Works of Art*. The products of industry are arranged in seven groups, viz: 1st group. Those having for their principal object the production or extraction of raw materials, as mining, lumbering, fisheries, agriculture, and the breeding of animals. 2d group. Industry, having for its special object the use of mechanical forces. 3d group. Those specially based on the employment of physical and chemical agents, relating to the sciences and instruction. 4th group. Those which relate to the learned professions, including hygiene, pharmacy, the military art, etc. 5th group. Manufactures of mineral products, such as jewelry, bronzes, glass ware, porcelain, enamel, etc. 6th group. Manufactures of tissues, cotton, linen, silk and straw manufactures. 7th group. Furniture and decoration, in fashions, manufacturers' designs, printing, and musical instruments.

The second division constitutes the 8th group, under the title of "the fine arts," and includes painting, engraving, lithography, sculpture, medal engraving, and architecture.

Chemicals are placed in the 3d group, 10th class, 1st section, and are arranged under the following heads, viz:

1. Apparatus and general processes of making chemical products.
2. Manufactured products principally derived from mineral substances.
3. Manufactured products chiefly derived from vegetable substances.
4. Manufactured products mainly derived from animal substances.
5. Various chemical products, made or purified chiefly for the sciences.

Pharmaceuticals are placed in the 3d group, 12th class, and 4th section, and arranged under the following heads, viz:

1. Pharmaceutical processes in general.
2. Articles of the materia medica in their natural condition.
3. Simple medicines, fixed and volatile oils, powders, &c.
4. Compound medicines; tinctures, pills, syrups, etc.
5. Accessories, surgical dressings, leeches, etc.

The whole is very systematically arranged, and if the numerous classes and sections are duly represented, the exhibition will be very comprehensive. So far as we have heard, but little general effort is being made in the United States, and in chemistry and pharmacy less than an average of the other branches of industry.

EDITORS *vs.* POSTAGE.—For some years past we have frequently been applied to through the post-office for information on pharmaceutical, chemical, and other subjects, which inquiries we have cheerfully endeavored to answer to the extent of our ability. The new post-office law, requiring pre-payment for *all* letters, will make it necessary for us to pass unnoticed all communications strictly relating to the business or interest of the writers, unless their importance should cause us to waive the rule. We do this in justice to ourselves, as, already, we have been at considerable expense in this way from the thoughtlessness of some correspondents. We trust, therefore, in all cases where a correspondent expects an answer relative to his own business, that a stamp will be enclosed.

DOMESTIC MEDICINES.—Under this caption the editor of the New Jersey Medical Reporter presents the following, viz.:

"If mankind, in general convention assembled, were allowed to vote on the question of death, or no death, we have little doubt but the hour of dissolution would be "postponed indefinitely," by a majority that would laugh a veto to scorn. Yet there is no foregone conclusion so inevitable, as that the pathway of life, whether strewn with flowers or thorns, by a descent, sometimes gentle, sometimes abrupt, ends in an open grave. This doom, however philosophically met, is met by the larger part of mankind with great reluctance, and the drowning man who catches at a straw, is an apt illustration of the absurd and irrational attempts often made to prolong life. It is this innate dread of death that has called into being the profession of medicine, and the business of the apothecary. It is this also that has led mankind to torture nature in pursuit of that chimera, the elixir of life, and induced so many mercenary individuals to speculate in human distress and infirmity as ruthlessly as they would in the funds of the Stock Exchange, if they had the ability. With what success this is done, may be seen in the palaces reared by quackery in most of our large cities.

It is astonishing to what an extent the uncertain and often deleterious preparations made by these men, are consumed by all classes of society; and there is no question but such a wholesale consumption of drugs, having no guarantee of their purity or innocuity but that of a single mercenary individual, is calculated to do untold injury to the health of the community. But there is a demand for domestic remedies which these preparations are intended to supply, and the question arises whether this demand can be supplied in a manner that will guard against the venality of using drugs of uncertain properties or deleterious qualities.

A considerable portion of the time of the American Medical Association is consumed every year in discussing plans for the suppression of quackery. This is certainly a consummation devoutly desired by all who have any regard for the welfare of the sick, and the only question is one of expediency.

We respectfully throw out the following suggestions on the subject, pre-

mising, that though often thought and spoken of by ourselves, they receive additional force from the action of a committee of the American Pharmaceutical Association, quoted on a subsequent page. [See vol. xxvi, page 393, Amer. Jour. Pharm.]

Let a committee be appointed by the American Medical Association, a part of whom should be pharmaceutists, or better, perhaps, let the committee act in unison with one appointed by the American Pharmaceutical Association, whose duty it shall be to draw up a set of formulæ for remedies, calculated to meet the ordinary demands of domestic practice. These formulæ should be adopted by the American Medical and Pharmaceutical Associations, and published for the benefit of all concerned—not excepting the consumer, when he desires to know their ingredients—and they should be as uniformly adhered to as any of our common officinal preparations. The medicines should be put up in uniform style, and issued under the sanction of the American Medical and Pharmaceutical Associations. In this manner the popular demand for domestic remedies will be supplied with medicines whose action can be relied on, and which can be honestly recommended in ordinary cases, by the apothecary, and even by the general practitioner. No countenance should be given by the apothecary to any of the numerous quack preparations with which their shops are now gorged, and the physician who should soil his fingers with them, should, of course, lose caste immediately.

The apothecary would reap advantage from such an arrangement, as he would prepare the remedies from the crude drugs, and receive all the profits on them, instead of being obliged to divide them with another party, who receives the lion's share.

We believe that the plan suggested above, if properly carried out, would do more towards the suppression of quackery, than any legislative action that can be brought to bear upon it. There are so many who are largely interested in the support of quackery, who, with their sympathizers, would be so restive under any legal inabilities, that if laws were passed bearing upon that evil, their operation and stability would be uncertain, and their execution most likely unsatisfactory."

We like the tone of Dr. Butler's remarks, as they indicate a willingness to adopt a practicable remedy for a great and crying evil. If such a series of these formulæ could be agreed upon as would apply to those ordinary cases as are usually treated in families without calling in the physician, and for want of which they often resort to quackery, and which the apothecary could recommend with safety and propriety, they would go far to displace from use a large portion of the quackeries of the day—a certain class of nostrums, addressed to the marvellous, and promising miracles, perhaps excepted.

Massachusetts College of Pharmacy.—We extract the following from the Boston Medical and Surgical Journal, viz.—

"The annual meeting of this institution was held at the rooms in Phillips Place, on Monday, March 5th. The officers elected for the ensuing year are, Daniel Henchman, President; S. M. Colcord and J. T. Brown, Vice-Presidents; Thomas Hollis, Corresponding Secretary; Henry W. Lincoln, Secretary; T. Larkin Turner, Auditor. The Trustees elected were Henry D. Fowle, Charles H. Atwood, George W. Parmenter, Augustus P. Melzar, John Buck, James S. Melvin, Robert R. Kent, Albert G. Wilbor.

The doings of the Board of Trustees for the past year were read and ap-

proved, reports were received from the various committees, and other usual business of an annual meeting transacted. The new and beautiful certificate of membership was ready for distribution to the members, intended to be put in a conspicuous place in their dispensary stores as a guarantee of *professional qualification* to the medical profession and the public. The college have also published, the past year, a uniform scale of prices. Its affairs seem to be in a very prosperous condition; and, having the confidence of the medical profession, it bids fair to wield a powerful influence, increasing in usefulness and professional advancement. City physicians favorable to the college would do well to write their prescriptions upon paper furnished them by any of its members gratis, with the names of their dispensers printed upon it."

Elements of Chemical and Physical Geology. By GUSTAV BISCHOF, Ph. D., Prof. of Chemistry and Technology in the University of Bonn. Translated from the MS. of the author by BENJAMIN H. PAUL, F.C.S., and J. DRUMMOND, M.D. Vol. 1. London: 1854. Printed for the Cavendish Society.

This is the first of the three volumes which are to constitute the work in its English dress. When the Cavendish Society entertained the idea of publishing a translation of Bischof, they determined to consult the author, and, as his first volumes had been published several years, to get him to prepare the copy for an English edition, which should not exceed 1500 pages in extent—the German edition extending to 3300—which was accordingly done. The author remarks, "The present edition, indeed, is by no means a mere translation or abridgement of the German, but an independent work, in which the chemico-geological facts ascertained since the preparation of the latter have been taken up so far as space permitted." The earnest Neptunian opinions of the author are sustained by very numerous observations and arguments, and some of his developments in regard to the remarkable influences of gases in solution in water, and in the atmosphere, are exceedingly interesting, and have led him to many views as novel as they at first are startling, as in the following paragraphs:

"When all these facts are considered, we cannot but come to the conclusion that sulphur is in no case a primitive production, but, as far as regards its principal localities, has resulted from the decomposition of sulphuretted hydrogen."

"Like carbon, sulphur appears to owe its existence in a free state to the organic kingdom. Carbonic acid is decomposed by living plants; sulphates are decomposed by dead organic matter. In this instance, as in so many others, the important influence of the organic kingdom upon the inorganic is perceptible, and the existence of sulphur, prior to organic life, appears very doubtful."

Liebig and others have referred the origin of the diamond to organic matter, that chemist attributing it to a gradual isolation of the carbon by the removal of hydrogen and oxygen by a process of decay. Our author combats this view by showing that the only rock in which the diamond has been found *in situ*, is of far later date than the coal formations in which we would most likely be induced to look for them, and refers their formation rather to the

deoxidizing agency of organic matter in contact with sesquioxide of iron and sulphates, resulting in the isolation of the carbon, which *in statu nascenti* might be capable of crystallizing. The author remarks:

"The geologists who ascribe to the earth an igneous origin, can adopt no other view than that all the carbon upon or in the earth is of secondary origin, and therefore was not present at the period of creation; for the reducing agent of the iron ores would not have remained in contact with peroxide of iron and other oxides in the state of igneous fusion without being converted into carbonic acid and carbonic oxide gases, thus causing the reduction of the oxides. Since the entire group of unstratified crystalline rocks, which, according to the hypothesis of the Plutonists, have been ejected from beneath, contain in their masses no carbon, this fact must lead them to the conviction that this substance cannot possibly be of an original formation.

"The foregoing considerations show that even carbon in its purest form as the diamond, can only be regarded as a product of the decomposition of organic substances. So long, therefore, as carbon in the unoxidized state and bearing all the marks of not having resulted from decomposed organic substances, is not shown to be preserved in rock, we cannot regard this simple body as one which existed at the time of creation. Carbon like all the other simple bodies occurs very sparingly or not at all in the mineral kingdom; just as we find all the other simple bodies, with the exception of chlorine, bromine, iodine, and fluorine, chiefly in combination with oxygen, and such of them as form the chief constituents of rocks are only thus combined; so we find carbon also *as a constituent of rocks*, only in the oxidized condi.ions in carbonates; thus we find it also in the exhalations, in waters and in the atmosphere."

"All the carbon as yet known to occur in the isolated condition, can therefore only be regarded as a product of decomposition of carbonic acid, and it is the vegetable kingdom which yielded and still yields this product."

We hope at a future opportunity to bring forward some interesting extracts from this work, which our limited space at present precludes. The second volume will be one of the volumes for 1855, and may probably be expected about the close of the year.

What to observe at the bedside and after death in medical cases. Published under the authority of the London Medical Society of Observation. Second American, from the second and enlarged London Edition. Philadelphia: Blanchard and Lea. 1855.

It will not be expected that a book with the above title will receive a critical notice in a journal devoted to pharmacy, yet a glance over the pages of this volume will show, even to the unprofessional reader, that the habitual observance of its precepts by the physician, must very much conduce to the accuracy of medical observation, and to the increase of medical knowledge.

On Adipocire and its formation. By CHARLES M. WETHERILL, Ph. D., M.D. Extracted from the Transactions of the American Philosophical Society.

We are indebted to the author for a copy of this paper, but it arrived too late for notice in this number.